NETWORK WORLD
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Desert Storm puts pressure on U.S. nets

By Network World Staff

Public and private network operators last week felt the repercussions of Operation Desert Storm, a massive war effort launched half a world away.

In the wake of the U.S.-led attack on Iraq, domestic telecommunications carriers were hit with dramatic increases in network traffic, as were financial services companies and exchanges — all of which reported that communications facilities held up well under the strain.

The outbreak of war also meant delays in service provision and network upgrades for some, as well as heightened security for both users and carriers.

Carriers reported major increases in network traffic on the evening war broke out and said traffic remained at higher than normal levels after the initial phase of the assault.

AT&T reported a 25% increase in domestic network traffic and a 40% jump in international traffic the night of the attack.

"The best way to describe the increase in volume is 'extraordinary,' " an AT&T spokesman in Washington, D.C. said. "There was some blocking of international calls [that night] and some

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View from the cockpit of a U.S. warplane.

Satellites help U.S. forces control the skies over Iraq

Kris Herbst
Special to Network World

They took off in darkness, allied aircraft rising from bases in Saudi Arabia and speeding toward Iraqi targets: Scud missile sites and air defense systems, as well as the nation's military command and communications network.

The choice of targets highlights the importance of network technology in modern-day war. Without high-speed data links and encrypted voice radio communications, pilots in the air and soldiers on the ground would be fighting blind.

With the world's attention focused on U.S. forces operating in the gulf, *Network World* explores the specialized network technologies employed by four branches of the armed services. This feature examines the networking systems of the U.S. Air Force, which shouldered much of the early attack on Iraq. Articles next week will discuss U.S. Army, Navy and Marine networking systems.

Long before the Jan. 15 deadline, it was clear that the initial phase of the war against Iraq would involve a massive air assault. The success of this opening assault and, ultimately, the U.S.-led Operation Desert Storm, depends on a mix of Air Force command, control, communications and intelligence networks that have been hastily assembled since

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Tools for developing distributed OLTP bow

IBM, HP, Stratus, Informix and others pledge to use tools to build distributed OLTP products.

By Jim Brown
Senior Editor

NEW YORK — Transarc Corp. last week announced software tools designed to speed development of on-line transaction processing (OLTP) monitors capable of managing the flow of data between workstations and multivendor data base management systems running on networked computers.

Vendors that have committed to building OLTP monitors using the Transarc tools include IBM, Hewlett-Packard Co. and Stratus Computer, Inc.

Informix Software, Inc. and Sybase, Inc. also pledged to enhance their DBMSs to work with OLTP monitors built using Transarc's tools.

The OLTP monitors will be capable of tracking each step of a transaction, from extracting requested data from multiple DBMSs to using a two-phase commit protocol to ensure that each data base is updated to reflect changes made by end users.

By comparison, most existing OLTP systems require all processing to be done on one system, typically a mainframe, by a single vendor's DBMS. Some companies, such as Digital Equipment Corp., have released distributed OLTP products, but even those require use of the same vendor's DBMS on each machine.

Users, however, are beginning to seek products that will enable them to distribute OLTP tasks across a network of processors

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Firms bring micros into image world

By Barton Crockett
Senior Editor

PHOENIX — Image networking took a step forward last week when three vendors unveiled products that let users integrate IBM and compatible personal computers with proprietary image processing systems.

Products from FileNet Corp., Digital Equipment Corp. and Wang Laboratories, Inc. let customers use standard microcomputers instead of proprietary workstations to access images on proprietary imaging systems.

"Having vendors like these approach the PC LAN environment is good for users and good for image processing because it lets users capitalize more on their existing investment," said Ajit Kapoor, vice-president and director of the image management services unit of the META Group, a consulting firm in Westport, Conn.

The three new products — the Workflo Business System from

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NETLINE

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PEPSI PLANS innovative 800-number contest during the Super Bowl. Page 2.

USER PRAISES Boole & Babbage integrated net management system. Page 2.

THE TRAVELERS OPTS for wireless LAN strategy. Page 2.

NETRIX TO DETAIL frame relay plans for circuit/packet switch. Page 4.

ICA MEMBERS say strategic partnerships with key suppliers help solve net problems, cut costs. Page 4.

START-UP CORAL'S switch combines T-3 mux, LAN bridging and routing capabilities. Page 4.

NEWSPAPER

FEATURE

Evaluating IBM's strategy for OSI connectivity

By Atul Kapoor
Special to Network World

Just two years ago, anyone who predicted that IBM would quickly become a leading OSI vendor would have been considered naive.

After all, IBM was a company that since its foundation had been wedded — very profitably — to the concept of proprietary architectures.

The saga of The New IBM Corporation for Open Systems began publicly on the morning of Sept. 20, 1988, with a breakfast briefing IBM held for selected consultants.

During the meeting, Ellen Hancock, vice-president and general manager of IBM's Communication Systems Division, announced that the vendor was including Open Systems Interconnection as a part of its master Systems Application Architecture (SAA).

She also said IBM was introducing its first major OSI product, the IBM OSI Communications Subsystem (OSI/CS). But

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Pepsi to launch massive Super Bowl 800 campaign

Television advertisements will prompt viewers to call a toll-free number to win $3 million in prizes.

By Wayne Eckerson
Senior Editor

SOMERS, N.Y. — Pepsi-Cola Co. last week announced that it will use 30,000 voice circuits and 10 service bureaus to support a glitzy Super Bowl advertising campaign that will ask television viewers to call a toll-free number for the chance to win more than $3 million in prizes.

Diet Pepsi's "You've Got the Right One, Baby, Uh-Huh!" interactive telephone contest, which will be held during the first three quarters of the Super Bowl on Jan. 27, could generate more than three million calls during a two- to three-hour period.

Industry observers said this could be the largest 800-number call-in project of its kind.

Pepsi will run television commercials before and during the Super Bowl prompting viewers to call one of four 800 numbers, depending on their geographic location. By calling, viewers can register to win one of three $1 million grand prizes or $1,000 runner-up prizes. Prize winners will be announced in a 30-second commercial after the game.

Carriers will route these calls using enhanced 800 services to the service bureaus contracted by Pepsi to handle them.

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Utility picks Net/Command for multivendor net mgmt.

Ease of use, breadth of vendor support lure user.

By Paul Desmond
Senior Editor

NEWARK, N.J. — After rejecting offerings from AT&T, IBM and Nynex Corp., Public Service Electric and Gas Co. (PSE&G) selected an integrated net management system from Boole & Babbage Network Systems to manage its multivendor T-1 network.

PSE&G said the Net/Command product was easier to install and supported more element management systems than offerings from the other three finalists in an evaluation completed late last month. PSE&G is now using the product to manage IBM's NetView and management systems from Network Equipment Technologies, Inc. (NET) and Racal-Milgo.

John Lewis, principal staff telecommunications analyst for the utility company, said Net/Command has enabled PSE&G to reduce the size of its net management staff and eliminate numerous management consoles.

Developed by Avant-Garde Computing, Inc., which Boole & Babbage, Inc. bought in February 1990, Net/Command is an integrated management system designed to collect alarm data from other net management systems and enable customers to manage multiple systems through the terminal-emulation and windowing

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Travelers to use wireless LANs in its nationwide net

By Wayne Eckerson
Senior Editor

BOSTON — The Travelers Corp. last week said it plans to make extensive use of wireless local-area networks nationwide, a move that could pave the way for greater acceptance of the emerging technology.

Implementation of wireless LANs will give The Travelers greater control over the multitude of network node moves and changes that its systems personnel must contend with each year.

At a gathering here in which BICC Data Networks, Inc. unveiled its InfraLAN product line, one of The Travelers' top network managers said the company could purchase as many as 100 wireless LANs this year.

In addition, 60% to 70% of The Travelers' workstations installed by 1995 could be supported by wireless LANs, according to Nick Blazensky, manager of the Site Design Unit of The Travelers' telecommunications division.

Acceptance of wireless LANs by The Travelers, one of the largest IBM shops in the insurance industry, is expected to bolster the image of what has been seen by many as a niche technology.

A key factor in The Travelers' decision to adopt wireless LAN

(continued on page 47)

Briefs

OSI/NM devises user council. The Open Systems Interconnection/Network Management (OSI/NM) Forum last week announced the formation of its User Advisory Council to provide a user perspective on forum plans. The council will consist of 15 to 18 permanent members representing a cross-section of industries in different regions. Forum members are in the process of nominating candidates for the council. The first meeting of the group is scheduled to take place in Washington, D.C. on March 6 and 7.

Systems Center sets layoffs. Systems Center, Inc., maker of the Net/Master network management system, last week announced it plans to lay off 92 employees, or a little more than 11% of its work force. Richard Moore, vice-president of marketing for the company, said the layoffs are the result of recent acquisitions that created overlap in many positions. He said only 3% of the layoffs came from positions related to Net/Master, the chief competitor to IBM's NetView for managing Systems Network Architecture nets.

Systems Center also announced last week that it will apply a onetime pretax charge of at least $25 million, related primarily to the Net/Master acquisition, to its fourth-quarter results. That will turn a fourth-quarter profit estimated at as much as $1.8 million into a loss of at least $23 million.

PictureTel product debuts. PictureTel Corp. today plans to introduce a new videoconferencing system, the System 4000, that costs 20% to 30% less than its flagship C3000 line. The new video coder/decoder and associated network gear is also 50% smaller than the C3000. The System 4000 uses a new, proprietary PictureTel echo cancellation algorithm that reportedly dramatically improves audio quality. Pricing for the System 4000 starts at $39,500.

Wellfleet adds SDLC support. As expected, Wellfleet Communications, Inc. announced a software upgrade for its bridge/routers that will enable users to consolidate synchronous and local-area network traffic over the same backbone link.

The Transparent Sync Pass-Thru feature, available next month with Version 5.6 of Wellfleet's bridge/router software, supports the transmission of X.25 and IBM Synchronous Data Link Control protocol Systems Network Architecture traffic.

Wellfleet's boxes will integrate support of synchronous traffic with other currently supported protocols, including Transmission Control Protocol/Internet Protocol, Apple Computer, Inc.'s AppleTalk, Digital Equipment Corp.'s DECnet, Novell, Inc.'s Internetwork Packet Exchange (IPX) and Xerox Corp.'s Xerox Network Systems. Customers with installed Wellfleet bridge/routers will receive the software upgrade free of charge.

IBM posts earnings gain. IBM last week reported fourth-quarter earnings of $2.46 billion, up from $591 million in the fourth quarter of 1990, when the company took a $2.42 billion charge against earnings in order to cover the cost of cutting 10,000 jobs, among other things.

IBM's revenue for the fourth quarter, ended Dec. 31, rose 13% to $23.06 billion from $20.46 billion in the fourth quarter of 1989.

IBM pointed to strong sales of its Application System/400 minicomputers and its new RISC System/6000 workstations as a few of the reasons for the strong quarter. Sales of those products helped cover a decline in mainframe sales. The company's earnings rose 60% for the year (16% without the restructuring charge) and revenue grew 10% compared with 1989.

Bill backs bandwidth boom. Sen. Daniel Inouye (D-Hawaii) last week introduced the Emerging Telecommunications Technologies Act of 1991 (S.218), which would transfer 200 MHz of government-allocated radio spectrum to the private marketplace. The bill, modified from one introduced in the last session of Congress, reflects compromises made with the military to ease opposition. The new bill offers increased spectrum sharing between government and industry, as much as 50% where feasible, and allows the government to present arguments to the Secretary of Commerce on the costs of shifting to new frequencies. The bill is aimed at relieving the lack of available spectrum for commercial personal communications networks. A twin bill was introduced in the House by Rep. John Dingell (D-Mich.).

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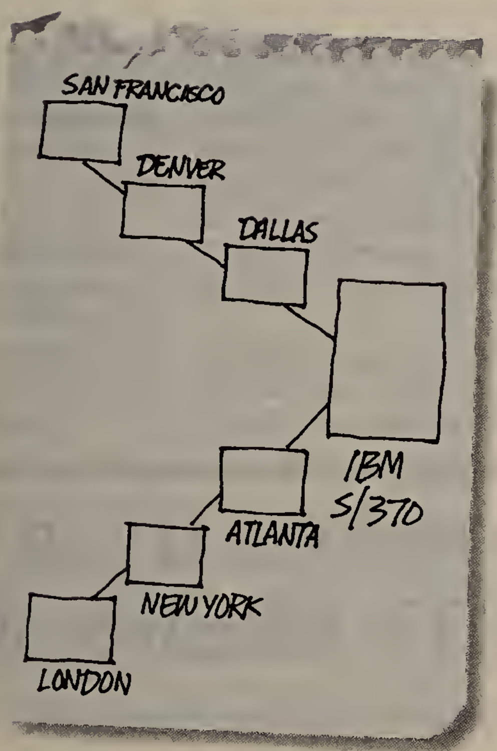

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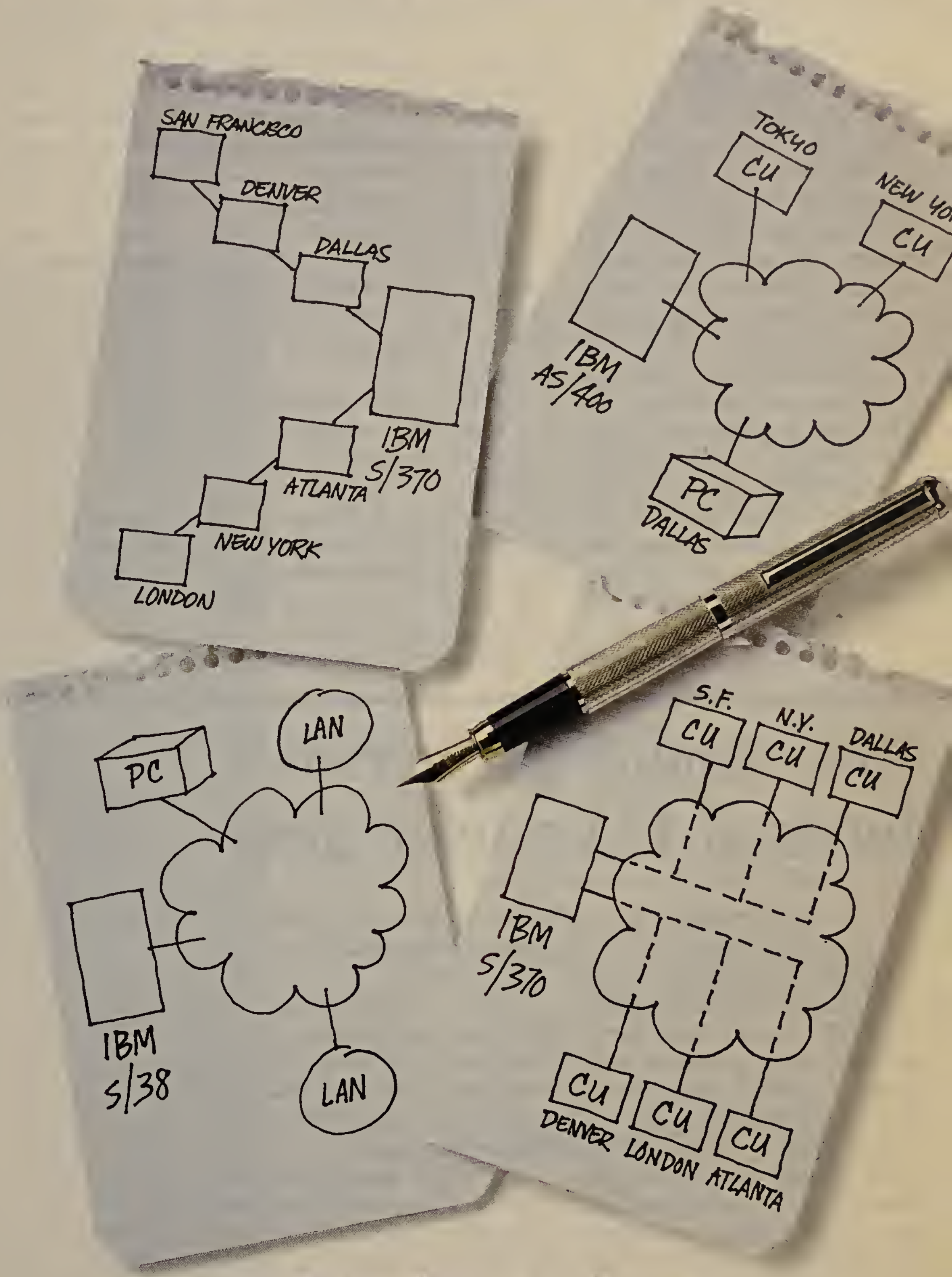

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Netrix set to detail frame relay support for #1-ISS

Firm will boost high, low ends of switch line.

By Paul Desmond
Senior Editor

WASHINGTON, D.C. — Netrix Corp. next week is expected to formally announce frame relay support for its integrated T-1 circuit/packet switch, along with a new low-end model, a new high-end configuration of the switch and enhancements to its net management system.

Netrix has already announced plans to support frame relay with a software upgrade to its #1-ISS switch. But at the Communication Networks '91 conference here, the company said it will provide details about product features, such as one that lets users assign a minimum amount of bandwidth to each application.

Net management capabilities for Netrix #1-ISS nets will be enhanced with the addition of SelectView, which lets users partition management of their nets by region or other criteria.

Netrix will also expand its #1-ISS switch line on both the high and low end. A new entry-level, 14-port Model 15 will support as many as two T-1s and will be available immediately for $12,500.

On the high end, Netrix will offer a 4M bit/sec processor-to-processor connection and software to link multiple high-end Model 70s, said Thomas Jones, vice-president of marketing at Netrix. That will let users configure nodes of more than 4,000 ports and 160 T-1 trunks.

The price for that capability is the same as adding more Model 70s, which has a starting price of $26,000, plus a nominal fee for the cable linking them together.

Frame relay

Analysts and users said they were impressed with the frame relay announcement, and two users plan to test the enhancement.

Rick Malone, a principal with Vertical Systems Group, a consultancy in Dedham, Mass., was briefed by Netrix. He praised the frame relay support but was wary about its rollout schedule.

Netrix said beta tests of its frame relay software would begin in April, which Malone said could indicate that the product is not fully developed. He also questioned whether Netrix would meet its third-quarter ship date.

"It's very likely that a beta test could last eight or nine months," Malone said. "This particular feature may not be available for a year or more."

But he said the addition of

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User/vendor partnerships focus of ICA winter meet

By Bob Wallace
Senior Editor

HOUSTON — Users at the International Communications Association's annual Winter Seminar last week discussed their efforts to build strategic partnerships with key suppliers.

According to attendees at the event, which focused on the changing relationship between users and vendors, a strategic partnership can enable customers and suppliers to work together more effectively in order to solve complex network problems.

Users said they are moving to strategic partnerships because the competitive bid process focuses largely on price, which they said is becoming a less important differentiator between products and services.

Under a strategic partnership, they said, users select one or two preferred network vendors from which they purchase most services and equipment under a multiyear contract.

In return for that commitment, customers are ensured the lowest possible prices and a higher level of service and support than what is provided to other buyers.

Users said establishing a strategic partnership obviates the time-consuming process of preparing competitive bids and lets them assign staff to more important projects.

"The competitive bid process, including RFPs, is a waste of time, effort and money — an exercise in futility," said C.W. Randall, vice-president of telecommunications for Citizens & Southern National Bank in Columbia, S.C. "The best quality, service and support come with strategic partnerships."

Featured speaker James Wetherbe, the publisher of "MIS Quarterly" and director of the MIS program at the University of Minnesota's Carlson School of Business, said, "If users go the way of the competitive bid, vendors will focus their proposals almost entirely on price. Partnerships can go far beyond price and are a far more effective means of [forging] a productive, long-term relationship."

Peter Brown, manager of corporate telecommunications for Digitial Equipment Corp. in Littleton, Mass., added, "RFPs tend to focus almost solely on price. With strategic partnerships, users can focus their efforts on negotiating the 'additionals.' The vendor's cost structure goes from being based on selling to supporting customers."

Mack Manning, office systems consulting principal for McGladrey & Pullen, a Schaumberg, Ill., accounting and consulting company, said his firm has moved away from the competitive bid process.

"We went from the shotgun RFP approach to selecting a strategic partner," Manning said. "In the past, we bought products and services one at a time from the lowest bidder. But we soon discovered that we needed a single vendor who could provide new [offerings] and integrate the different systems {in place]."

At the foundation of the stra-

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NW beefs up LAN staff

FRAMINGHAM, Mass. — *Network World* last week announced the addition of two senior-level reporters covering the local-area network arena.

Senior Editors Caryn Gillooly and Eric Smalley will report on major technology developments, issues affecting LAN users and suppliers, and the LAN strategies of major U.S. organizations.

Gillooly joins *Network World* from DataTrends Publications in Vienna, Va., where she served as national correspondent for "The DataTrends Report on DEC and IBM" as well as the LAN newsletter "Netline." She has also served in editorial positions with *CommunicationsWeek* and *CommunicationsWeek International*.

Gillooly will be based in Vienna. She can be reached at 7965 Tyson Oaks Circle, Vienna, Va. 22180, or by calling (703) 442-3874 or faxing to (703) 442-4968.

Smalley, who will work out of *Network World*'s headquarters here, is a former deputy news editor for *Digital Review*. In that position, he assigned and edited news stories and reported on networking issues for users of Digital Equipment Corp. products. Smalley previously served as a senior writer for *Digital Review*.

Start-up to unveil hybrid T-3 mux, bridge/router

By Jim Brown
Senior Editor

MARLBOROUGH, Mass. — Start-up Coral Network Corp. this week is expected to introduce a high-speed hybrid switch that combines T-3 multiplexing with LAN bridging and routing capabilities.

The company's Broadband Enterprise Switch enables users to concentrate all three functions in a single piece of hardware, instead of buying separate devices. It also enables users to consolidate traffic from existing bridges and routers over a high-speed backbone, eliminating the need to attach each bridge or router to a separate leased line.

The Broadband Enterprise Switch is a stand-alone unit with numerous internal slots to accommodate various local- and wide-area network interface boards. It can support circuit-switched applications, such as establishing a link between remote videoconferencing systems, in addition to supporting packet-switched applications such as linking LANs.

The first two models of the Broadband Enterprise Switch, due to ship by June, will support Ethernet and Fiber Distributed Data Interface. In the third quarter of 1991, the company said it will unveil interface boards supporting token-ring, fractional T-1, T-1 and T-3 interfaces, along with software enabling the unit to support frame relay protocols.

The company, which is partially bankrolled by LAN pioneer Charles Bass, an Ungermann-Bass, Inc. founder, said the switch also will eventually support the emerging Synchronous Optical Network standard.

The first model, called the CX1200, supports four interface board slots, while the CX1600 comes with 10 slots. The CX1200 and CX1600 can each support a maximum of three FDDI interface boards, each supporting a single net. The CX1200 can support as many as four Ethernet interface boards, each supporting two Ethernet ports, while the CX1600 can support a maximum of 10 ports.

Each of the interface boards plug into slots connected via an internal 800M bit/sec bus. The bus relies on time division switching to route incoming data from interface boards to a central pro-

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Lawmakers try to block AT&T's takeover of NCR

Warn that buyout could threaten competition.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Three prominent members of the U.S. House Telecommunications and Finance Subcommittee last week asked the FCC to investigate whether AT&T's proposed takeover of NCR Corp. could pose problems for U.S. network users.

Rep. Edward Markey (D-Mass.), chairman of the subcommittee, raised concerns in a letter to Alfred Sikes, chairman of the Federal Communications Commission, that the takeover may harm users by reducing competition and innovation.

Rep. Michael Oxley (R-Ohio) and Rep. Dennis Eckart (D-Ohio), who represent districts in which NCR has sizable operations, also signed the letter.

The lawmakers, who are seeking to block the takeover attempt, questioned whether AT&T might use Tariff 12 network deals or proposed regulatory freedom to bundle equipment with regulated services to boost sales.

"Would the commission expect AT&T to market jointly its custom tariff-related services packages along with NCR computer products and services?" the congressmen asked Sikes in the letter. "Would AT&T have an increased ability and incentive to condition . . . the availability of its CPE or transmission services upon a customer's agreement to take both?"

Also last week, 22 congressmen from several states wrote to President Bush with concerns that the AT&T takeover would damage competition in the computer industry. Last month, 13 members of Ohio's U.S. House delegation sent letters to the FCC and Department of Justice. They raised concerns that an AT&T takeover of NCR might open the door to cross-subsidization.

"AT&T has lost an estimated

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Correction: In the article "SONET technology brings solutions and questions" (*NW*, Jan. 14), David Owen was incorrectly identified. He is the director of product marketing for Network Equipment Technologies, Inc. in Redwood City, Calif.

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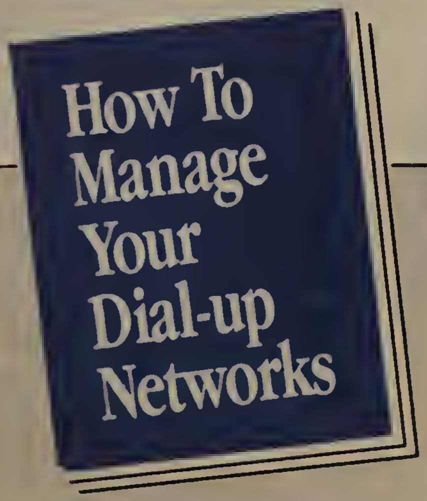
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See The FAXNeT Form on Page 28

Despite court ruling, FCC gives nod to two more Tariff 12 deals

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T's Tariff 12 passed an important legal hurdle last week when the FCC gave the go-ahead to two deals filed after an appeals court ruling that overturned the controversial custom network tariff.

The deals for John Hancock Mutual Life Insurance Co. and an unnamed customer were the first Tariff 12 filings from AT&T after an appeals court here ruled in October that the Federal Communications Commission had erred in its decision allowing AT&T to offer custom network deals. In its ruling, the court ordered the FCC to reexamine the issue.

In the wake of that ruling, some observers said the FCC's handling of new deals would be an important indicator of the agency's thinking as it reopened its investigation into Tariff 12.

The FCC's order last week allows the two customers to begin receiving service under their custom net arrangements. However, they could be affected by the outcome of the FCC's reexamination of the legality of Tariff 12.

AT&T's rival carriers, US Sprint Communications Co. and MCI Communications Corp., had hoped that the court's ruling would derail Tariff 12. But over the last month, FCC officials implied they would not hold up new filings.

At a conference in December, Richard Firestone, chief of the FCC Common Carrier Bureau, said the agency wanted to keep Tariff 12 on track and ensure that customers were not disrupted.

In its order allowing the two deals to take effect, the FCC echoed this theme. Although US Sprint, MCI and Williams Telecommunications Group, Inc. had asked the FCC to suspend the deals, the agency said they failed to make a convincing case.

In what has become an FCC trademark on tariff matters, the FCC dismissed objections against the custom network deals in one line: "We conclude that no compelling argument has been presented that these tariffs are so patently unlawful as to warrant rejection."

Although the deals are in the clear for now, the FCC still has not officially announced how it will conduct its reexamination of Tariff 12. It is widely anticipated that the FCC will confine its investigation to the first four Virtual Terminal Network Service deals plus an older Tariff 12 option that is no longer being purchased. Technically, the court order applies only to these deals because they were the only ones in existence at the time of the appeal. But the FCC has ruled that even if later Tariff 12 deals are not included in the investigation, they will be subject to its outcome.

Pepsi to launch 800 campaign

continued from page 2

The service bureaus will use audio response units to greet callers with a message recorded by performer Ray Charles and then record the names and addresses of the callers. Every caller will be sent a coupon for a free 2-liter bottle of Diet Pepsi.

The contest will use 800 service from AT&T, MCI Communications Corp. and US Sprint Communications Co. AT&T will serve the Northeast and Midwest regions with two 800 numbers, MCI will serve the South, and US Sprint will handle calls from the West. All four 800 numbers will be broadcast on the Pepsi television ads.

According to Dick Goulet, director of product management for 800 services at US Sprint, the carriers will randomly allocate a certain number of calls to a special location staffed by Pepsi operators. Callers fortunate enough to connect with one of these operators will be considered contest finalists and will qualify to win one of three grand prizes.

Slow Sunday

A Pepsi official said a project of this size could not be held any other day of the year because call volumes would interfere with other call-in business handled by the service bureaus. Bureau records indicate that Americans make the fewest number of 800 calls on Super Bowl Sunday.

According to Brad Cleveland, a partner of Cleveland & Cleveland, a consulting firm in Boise, Idaho, that specializes in incoming call center issues, the advertising campaign could jam local exchange networks. "This is a huge promotion, and I expect that the local exchange carriers will monitor their traffic closely," Cleveland said. "Callers will encounter quite a few busy signals."

Pepsi has carved out a reputation for staging highly innovative and risky big-event advertising campaigns such as this in an effort to increase name recognition and market share, according to Roy Burry, an analyst at Kidder, Peabody & Company, Inc., which tracks Pepsi. A Pepsi spokesman said the company expects the interactive game will increase viewer recall of its television ads and help distinguish Diet Pepsi from its competitors in the fast growing diet soft drink market.

With Chipcom, all you need to reconfigure your network

is this simple tool.

Managing your company's network just got easier. Chipcom's ONline System Concentrator™ gives you a totally new dimension in freedom and flexibility for configuring and reconfiguring large, complex networks.

The unique TriChannel™ architecture of ONline supports not just one, but up to three separate Ethernets. Or any combination of Ethernet, Token Ring and FDDI networks. All at the same time, and all within a single ONline concentrator.

Integrated bridging and routing, and a sophisticated network management system allow moves, adds and changes to be made with fingertip ease.

Someday, perhaps, all networks will be as reliable, easy to manage and flexible as Chipcom's.

But for now, no one else can lay a finger on us.

For more information, call **1-800-228-9930.**

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Networking as it will be.

GSA# GS00K90AGS5185

See The FAXNeT Form on Page 28
See us at Comnet, Booth #370

There's only one PBX system that won't be blown away by the future.

When the future comes knocking, only one PBX has both the flexible architecture and power to answer the challenge. The Fujitsu F9600.™ Unlike others who've retrofitted older PBXs, the F9600 was designed from the start to take advantage of emerging telecommunication services—like ISDN and broadband. For starters, its distributed processor architecture lets you add capacity and functionality simply by adding processor modules. Its single stage switching matrix provides smooth growth and fast processing of voice, data and, when you need it, broadband services such as video. And thanks to its high-level applications-oriented software, new applications can be added as quickly as your needs change. Today, the system is performing worldwide in over 1,300 installations. Which shouldn't come as a surprise, considering Fujitsu Ltd. is a pioneer in ISDN technology and an $18 billion global leader in computers and telecommunications. To see just how much better the F9600 really is, call Fujitsu Business Communication Systems at 1-800-654-0715. You'll find that with the F9600, the future's nothing to be afraid of.

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FUJITSU BUSINESS
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See The FAXNeT Form on Page 28

At ROLM, we encourage our most valuable employees to look into other professions.

And they look pretty hard. Into Insurance, Banking, Healthcare, or whatever your field happens to be. Because, along with knowing the telecommunications business, we require our reps to have a knowledge of yours. Only then can they provide you with a telecommunications system designed to meet your specific needs.

Our people stay involved in your profession long after your voice and data facilities are combined into one integrated system. Because a system can't help your business run more effectively until each of your employees knows how to use it. Your ROLM® rep can recommend specific applications designed to improve productivity. PhoneMail® for instance. The voice messaging system that not only eliminates missed and garbled messages, but also records, stores, routes, or even ties messages to a computer. And Automatic Call Distribution that functions as a communications manager to expedite and route your customers' calls to available agents as efficiently as possible.

It takes some extra time and effort, not to mention a lot of investigation, to learn a new profession. But at ROLM, that's the only way we work. Because we know the best way to mind our business is to make sure we're minding yours.

For more information, call ROLM at 1-800-624-8999 extension 235, or contact your authorized ROLM Business Partner.

ROLM
An IBM and Siemens Company

We ask better questions. You get better answers.

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See The FAXNeT Form on Page 28

PROGRAM UPDATE

SUPERCOMM® '91

UNITED STATES TELEPHONE ASSOCIATION

TELECOMMUNICATIONS INDUSTRY ASSOCIATION

Gateways to Knowledge℠

Introducing:

Fiber Perspectives '91

Featuring Forum and Exhibits
for Managing Transitions

SUPERCOMM '91
International
Conference and
Exhibition

March 18-21, 1991

George R. Brown
Convention Center
Houston, Texas

SUPERCOMM® '91

SUPERCOMM '91
International
Conference and
Exhibition

March 18-21, 1991

George R. Brown
Convention Center
Houston, Texas

Introducing your complete booklet of information for SUPERCOMM® '91

Here it is! Everything you need to know for the SUPERCOMM '91 International Conference and Exhibition. Use this booklet as your guide and reference to the largest annual telecommunications event in the world!

Your "Gateways to Knowledge" program offers the broadest selection of seminars, exhibits, forums, panels, tutorials, and special presentations geared specifically for the telecommunications industry.

A special focus for this year's event includes the all-new "Fiber Perspectives '91"– Featuring Forum and Exhibits for Managing Transitions. In addition, separate international conferences will be hosted by the Pacific Telecommunications Council (PTC) and the Caribbean Telecommunications Council (CTC). Plus, a 100-person delegation representing the Association of Telephone Companies in Finland adds to the international accent.

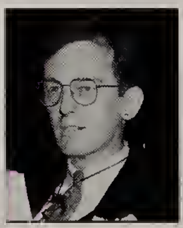
SUPERCOMM '91 brings you the most diverse educational opportunities available. You'll have the chance to meet 15,000 professionals from the U.S. and 50 other countries. And you can see hundreds of demonstrations of the newest and most innovative telecommunications products.

At SUPERCOMM '91, you'll have the opportunity to attend 52 free sessions in 500,000 square feet of space with nearly 500 free exhibits. Don't miss it!

Opening Sessions at 9:00 a.m.

Tuesday: Federal Communications Commission Chairman Alfred Sikes keynotes SUPERCOMM '91 on Tuesday, setting the tone for the international conference and exhibition. He'll provide insight into U.S. telecommunications issues, comment on international developments, and discuss the global network of the future. Exhibits open at 10:00 a.m. immediately following his keynote address.

Wednesday: The role telecommunications plays in improving and contributing to society will take on increasing importance. Northern Telecom's presentation – with James Burke, creator and host of the TV documentary *Connections* – will explore the mix of technology, marketing, and public acceptance that determines the kind of future our industry is allowed to create.



Thursday: This key session hosted by "Official Publishers" *Telephony* and *Network World* explores the evolving relationship between interexchange and local exchange carriers. As both types of carriers strive to add value for their customer base, the original structure of their relationship is changing. As different levels of service – ranging from T-1 to ISDN – are provided, the old issue of bypass is becoming more explosive. Customers don't care which type of carrier meets their needs, but they are unwilling to settle for less than they want because of jurisdictional differences. The panel examines whether the two wings of the industry work together to meet changing needs. **Moderator:** *Network World* Publisher Gary Beach.

The Spotlights Are on Important Issues at 1:00 p.m.

Monday: Research and Development – The Key to Competitive Positioning in the 1990s. The engine that drives the increasing pace of new product and service offerings is research and development. Telecommunications policy makers from the U.S. government, service and equipment suppliers explore the ways research and product development can be encouraged to allow domestic suppliers to maintain their competitive edge. **Moderator:** TIA President Allen R. "Mike" Frischkorn.

Tuesday: Searching for Common Ground. USTA President John Sodolski leads a stimulating discussion focusing on local carrier and end user issues. Panel members will be representatives of the International Communications Association and United States Telephone Association Boards of Directors. Interrelationships and future directions of these two associations will be explored in a frank and constructive exchange. Where is the common ground in our vision of tomorrow?

Who We Are:

Based in Washington, D.C., USTA represents approximately 1,100 local exchange telephone companies throughout the United States.

With over 600 members, TIA is the largest association in the United States representing manufacturers and suppliers of telecommunications equipment and services. TIA has offices in Chicago and Washington, D.C.

Wednesday: New Horizons for Telecommunications in Education. Partnering with the education industry is a formula for success that provides both a social and economic payoff. Panelists will discuss the partnership of education and telecommunications. **Moderator:** Pat Parker, Vice President-Marketing-Texas, Southwestern Bell Telephone.

Who Should Attend

Anyone interested in public and private telecommunications who wants to take advantage of new products and developments. Anyone who wants an improved knowledge base through highly focused seminars and comprehensive data on the most innovative telecommunications technologies. And anyone who would benefit from making thousands of potential business contacts. Join professionals from local exchange telephone companies, interexchange carriers, end users, interconnect companies, cellular carriers, international telecommunications companies, and manufacturers.

Why You Should Attend

SUPERCOMM offers more essential information for free in four days than you'll find in a year's worth of reports, journals, meetings, or conferences. This event offers so much more geared just for you – today's telecommunications professional. You make contacts. You gain in-depth knowledge. And you foster your career. With all these advantages, it certainly makes good sense to attend.

SUPERCOMM '91 Exhibition

This year SUPERCOMM '91 is featuring 500 exhibitors displaying thousands of innovative products and services. Products you'll need to build the flexible and powerful systems of tomorrow. Services you'll need to build, maintain, and strengthen support. These are the companies with the know-how to propel you into the next century. Just look at the sample listing of products you can see first hand:

Accessories • Accounting Services and Systems • Alarm Reporting Systems • Antennas • Automatic Call Distributors • **B**atteries-Storage/Chargers/Test Equipment • Booths-Telephone • Building Cable Systems/Storage • **C**able-Plows and Reel Trailers/Pressurizing Equipment/TV Equipment and Systems • Call Accounting • Carrier Equipment • Cases/Custom Built • Cellular/Mobile/Paging Systems • Centrex Systems Products • Communications Equipment • Construction Equipment and Supplies • Cords-Switchboards/ Telephone Sets • **D**ata Communications Equipment and Systems • Data/Electronic Matrix Switches • Data Terminals • Diagnostic Monitoring Systems • Ducts • **E**lectronic Mail • Engineering Services • **F**acsimile (FAX) • Fiber Optic Communications Equipment and Systems • **I**ntegrated Voice/Data Terminals • Interconnect Equipment and Services • ISDN Products • **K**ey Systems • **L**adders • Loading Coils • Local Area Networks (LANs) • Locators • **M**aintenance Equipment • Metropolitan Area Networks (MANs) • Microwave Communications Equipment and Systems • Mobile Power Units • Mobile Radio Telephones • Modems • Motor Truck Bodies • Multiplexers • **O**ffice Machines and Equipment • Operational Support Systems • Outside Plant Equipment • **P**acket Systems • Patching and Switching Equipment • Pay Telephones and Peripherals • Pole Line Equipment • Power Supply Equipment • Printers-Computer • Private Branch Exchanges (PBXs) • Protection Equipment • Protocol Converters • **R**adio Communications Equipment and Systems • Rate Services • Ringing Equipment • **S**atellite Communications Equipment and Systems • Security Equipment • Service Bureaus • Signs/Identification Systems • Software • **T**1 • Telecom Management Aids • Telecommunications Equipment Distributors • Teleconferencing-Audio/Video • Telephone Apparatus/Auto-Answer Equipment and Systems • Telephone Equipment and Systems-New/Remanufactured • Telephone Management Systems and Software • Telephone Marketing Systems • Telephone Supplies • Telephone Switching Equipment • Telex • Terminals • Test Equipment • Time Announcement Equipment • Transmission Equipment • **V**oice Equipment/Voice Mail • **W**ide Area Networks (WANs) • Wire/Wire and Cable • **X**.25 Products

SUPERCOMM '91
International Conference and Exhibition
March 18-21, 1991

George R. Brown Convention Center, Houston, Texas

EXHIBIT HALL FREE ADMISSION

Walk through 500,000 square feet of high-tech displays and hands-on demonstrations. Nearly 500 free exhibits in all!

Monday, March 18: No Exhibits

Tuesday, March 19: 10 am - 5 pm

Wednesday, March 20: 9 am- 5 pm

Thursday, March 21: 9 am - 3 pm

The Premier Corporations Are Here

From all over the globe, premier corporations are gathering to show their products. Join us to see what the exciting world of telecommunications has to offer. All under one roof!

A ACI Telecom
ACS Communications, Inc.
ACT Communications, Inc.
ADC Telecommunications
Adirondack Wire & Cable
ADK Pressure Equipment Corp.
Adtran
Alcatel NA
Alcoa Fujikura Ltd.
Alpha Technologies
American Computer
American Digital Switching
American Electric
Ameritec Corp.
AMP Inc.
Anco/Pan International
Andersen Consulting
Angeles Group, The
Anritsu America
ANT
Antel Optronics, Inc.
AOFR, Inc.
Applied Computing Devices
Applied Digital Access
Applied Voice Technology
ARNCO Corp.
Ascom Warren, Inc.
Association of Telephone Companies in Finland
Aster Corp.
AT&T
ATI Supply, Inc.
AudioSears Corp.
Augat Communications Group

B Bally Engineered Structures
Bard Mfg. Co.
BECO Mfg. Corp.
Bell Atlantic
Bellcore
Benner-Nawman
Berry Company
Berry Test Sets
Boston Technology
Broadband Technologies
Burnup & Sims
Business Communications Review
Butler Telecommunications

C C&D Charter Power Systems
CADTEL Systems, Inc.
CANAC Telecom
CANADA, External Affairs & Int'l. Trade
Carlon, a Div. of Lamson & Sessions Co.
Carsonite International
CEECO
CERJAC, Inc.
Champion Products, Inc.
Champlain Cable Corp.
Channell Commercial
Chesilvale Electronics Ltd. Corp.
Cincinnati Bell Information Systems
Circa Telecommunications
Coastcom
Code-A-Phone
Cognitronics
Coil Sales & Mfg.
Comdial Corp.
Commercial Electric Products
Communication Equipment Brokers, Inc.
Communications Data Group
Communications International
Communications Mfg. Co.
Communications Technology Corporation
Communications Week/CMP Publications
Communico Supply, Div. of Communico Inc.
COMMUNISYS Technologies, Inc.
Comshare, Inc.
Consultronics Ltd.
Copperthorne Industries 86 Ltd.
Cordell Mfg. Inc.
Crest Industries
Crispaire Corp.
CSE Vidar

D Dantel
Datacom Technologies Inc.
Data Products
DBA Communication Systems Inc.
DCM Industries
Dexter Corp./Hysol Div.
Dialogic Corp.
Dielectric Communications
Digital Equipment Corp. (DEC)
Digital Transmission Systems
Digitech Industries
Ditch Witch
D&S Communications, Inc.
DSC Communications
Dupont Building
Dynacom

E EASI FILE Corp.
ECI Telecom
Electrodata
Electronic Tele-Communications
Elgin Electronics
Enghouse Systems
Ericsson Components
Ericsson Network Systems
ETL Testing Laboratories, Inc.
Evergood Fabrication

- Exide Corp.
- **F** Famous Telephone
- Fishel Co.
- Fisher Research Lab.
- Fitel General
- FOF Products
- Fort Worth Tower Co.
- Fortec
- FTS/Austron
- Fujitsu America
- **G** Generac Corp.
- General Cable
- GMP
- GN Navtel Ltd.
- GN Netcom
- GNB
- GNWC
- Graphic & Data Solutions
- Grass Valley Group
- Graybar Electric
- **H** Hall's Safety Equipment
- Harmony Systems Ltd.
- Harris/Dracon
- Harris-McBurney
- Hartford Concrete
- Heath Consultants
- Hekimian Labs.
- Henkels & McCoy, Inc.
- Hewlett-Packard
- Homaco
- Hood Communications
- **I** IBM
- Ideal Industries
- IEEE Communications Society
- Imonex, Inc.
- Independent Technologies
- Independent Telecommunications Network (ITN)
- Industrial Technology
- Information Publishing
- Integrated Network Corp.
- Intergraph Corp.
- International Computers Ltd. (ICL/CCI)
- ITEC
- Iwatsu America, Inc.
- **J** Johnson Controls, Specialty Battery Div.
- Joslyn Electronic Systems Corp.
- Julie Associates
- **K** Keptel/Armiger
- Klein Tools
- Kohler Co.
- **L** LaMarche
- Larse Corp.
- Larus Corp.
- Laser Precision
- Lasertron
- Leasametric, Inc.
- Leviton Mfg.
- LorTec Power Systems/IPM
- Lynn Electronics
- **M** Macrotel International
- Mark Products
- Mars Electronics
- Mast Advertising & Publishing
- Masterack Div. Leggett & Platt
- Matt M. LaVail, Inc.
- Medeco Security Locks
- Melard Technologies
- Metrotech Corp.
- Metro Tel
- MICC
- Micro Computer Systems
- Microflect
- Microtronix Systems
- Microwave Logic
- Microwave Networks
- Midtronics
- Miller Telecom Services
- Mirror Telephony Software, Inc.
- Mobile International
- Motorola Communications & Electronics
- Motorola Government Electronics Group
- Mustang Enterprises
- **N** National Farmers Union Insurance
- NCR Corp.
- NEC America, Inc.
- NEPTCO, Inc.
- Network Access Corp. (NAC)
- Network Communications
- Network World
- Networking Management Magazine
- Newbridge Networks
- NIFE Corp.
- North American Telephone
- North Supply
- Northern Telecom/OPD
- Northern Telecom
- NovAtel Communications
- Noyes Fiber Systems
- NTT America, Inc.
- Nutmeg Utility Products
- NYNEX
- **O** Octel Communications
- Onan
- Oneac Corp.
- Opti-Com
- Outside Plant Magazine
- PairGain Technologies
- **P** Palco Telecom
- PANAMAX
- Pen-Cell Plastics
- Periphonics Corp.
- Phoenix Microsystems
- Phoenix Telecom
- Photon Kinetics
- Photonics Spectra
- Pirelli Cable Corp.
- Plantronics
- Plug-In Storage Systems (PSSI)

(con't. on next page)

Porta Systems
Power & Telephone Supply
Power Conversion Products
Preformed Line Products
Prism Systems, Inc.
Progressive Computing, Inc.
Protel
PSI Telecommunications
Public Utilities Reports, Inc.
Publishers for Conventions
Pulsecom Div., Hubbell Inc.
Pylon Electronic Dev.

Q QUAZITE
Quintrex Data Systems

R R.J. Enterprises
Radiation Systems/Mark Antennas Div.
Radiodetection
Rainbow Technology
Random Corp.
Ratelco
Raychem/Telecom Div.
Raynet Corp.
Redcom Labs
Regal Electronics
Reliance Comm/Tec
Remote Switch Systems
Roadrunners International
Rockwell Communication Systems
Rose Electronics
Rycom Instruments

S Sage Instruments
Schmid Telecommunication
Schonstedt Instrument Co.
Science Dynamics
Scientific-Atlanta
Seiko Instruments USA Inc.
Seiscor Technologies
Siecor Corp.
Siemens Solar Industries
Siemens Stromberg-Carlson
Sierra/LSI Jennings
Silton Co.
SNC Mfg.
Southern Bell/South Central Bell
Southwest Electronics
Southwestern Bell Corp.
Sparton Technology, Inc.
SpecTran Corp.
Spectrum Corp.
Stratus Computer
Sumitomo Electric Fiber Optics
Summa Four
Superior Teletec
Suttle Apparatus
Switchcraft, Inc.

T T.A. Pelsue
T-Com
Tamaqua Cable
Tandem Computers
Tau-Tron
Tek Communication Services
Tekelec
Tektronix
Tel electronics
Telamon Corp.
Telco Intercontinental Corp.
Telco Systems
Telcor
Telecom Gear
Telecom Response
Telecom Solutions
Telecommunications International
Telecommunications Techniques
Teleconnect Magazine
Telect
Telephone Engineer & Management
Telephone International
Telephony Publishing
TeleSciences
Telesync
Tellabs
Teltone
Teltrend, Inc.
Teradyne, Inc. – Telecomm Div.
Test Technology
Texas Instruments
Thomas & Betts
3M Telecom Systems Group
TIA
Time Mfg.
Timeplex
Toggler Anchor Systems, Div. Mechanical Plastic
Tone Commander Systems
TouchFax Information Systems
TranSwitch Corp.
Trimm Inc.
Triplett
Trompeter
T.S.I. of Florida
TTI, A Unit of General Signal
TW Comcorp
Tyton

U USTA
U.S. Intelco Networks/Independent Telecommunications Network
Uniden America Corp.
Unipage
Unisys

V Vari-Tronics
Verilink
VFP
Virgo Publishing

W Wandel & Goltermann
Westell
Westronic Systems
Wheelock
Wicom
Wiltron
Wiremold

And many more!

SUPERCOMM '91 At-A-Glance

	Monday Exhibits Closed	Tuesday Exhibits Open 10-5	Wednesday Exhibits Open 9-5	Thursday Exhibits Open 9-3
8:30		Continental Breakfast	Continental Breakfast	Continental Breakfast
9:00	*TUTORIAL – ISDN **TE**	**Opening General Session** FCC Chairman Al Sikes Keynote Address	**Second General Session** Northern Telecom Presentation	**Third General Session** *Telephony/* *Network World*
9:30	**Primer:** 1 **MG** Telecom "Buzzwords" **Seminars:** 2 **SI** Europe '92 3 **OP** Operational Support Systems 4 **TE** Advanced Intelligent Network			
10:00		ASIA-PACIFIC TELECOMMUNICATIONS CONFERENCE (see registration form on page 12)		
10:15		**Seminars:** 17 **TE** SONET – Basics 18 **TE** ISDN 19 **MG** Technology Challenge for Small Telcos 20 **MK** Marketing New Services 21 **TE** Gigabit Net Testbeds 22 **TE** Numbering Issues	**Seminars:** 29 **TE** SONET – Applications 30 **SI** Customer Premise Equipment 31 **PO** Infrastructure Issues for Small Telcos 32 **MK** 800 - 900 Services 33 **MG** Billing Challenges 34 **TE** Voice Information Services CARIBBEAN TELECOMMUNICATIONS CONFERENCE (see registration form on page 12)	**Seminars:** 41 **OP** SS7 Update 42 **MK** Houston Users' Roundtable 43 **MG** Digital Cross Connects 44 **MK** New Product Development 45 **OP** Satellite Communications 46 **MK** Facsimile
10:45				
11:00	**Primer:** 5 **TE** Fiber Optics **Seminars:** 6 **SI** Eastern Europe 7 **MG** Network Management Control 8 **TE** Open Network Architecture			
11:30		**"Fiber Perspectives '91"** Lunch/Lecture (see Fiber Perspectives session choices on pages 10 and 11)	**"Fiber Perspectives '91"** Lunch/Lecture (see Fiber Perspectives session choices on pages 10 and 11)	**"Fiber Perspectives '91"** Lunch/Lecture and Wrap-up Panel (see Fiber Perspectives session choices on pages 10 and 11)
12:00				
12:15				
1:00	*TUTORIAL – WIRELESS **TE**			
1:30	**Spotlight Panel:** Telecom Research TIA Host	**Spotlight Panel:** Local Carriers/End Users USTA Host with ICA	**Spotlight Panel:** New Horizons for Telecom in Education Southwestern Bell Host	
2:30				
2:45	**Primer:** 9 **TE** ISDN **Seminars:** 10 **SI** Mexico/Brazil 11 **TE** Fiber 12 **PO** Infrastructure Development – Legislation	**Seminars:** 23 **MG** Impact of Wireless 24 **TE** LAN Interconnection 25 **PO** Infrastructure Development – Executive Branch 26 **MK** Operator Services 27 **MG** Videoconferencing 28 **OP** EDI, EFT and Bar Coding	**Seminars:** 35 **MG** Cellular and Wireless 36 **TE** Broadband ISDN 37 **TE** Network Strategies 38 **MK** Centrex 39 **OP** Videotex Gateways 40 **TE** SMDS – Update	
4:00				
4:15	**Primer:** 13 **TE** LANs/MANs **Seminars:** 14 **OP** End User Network Management 15 **MG** Service Quality 16 **PO** Infrastructure Development – Judicial			
5:30				

Planning Information

To assist in your seminar selections, we've divided SUPERCOMM '91 sessions into six categories:

MG – Management
MK – Marketing
OP – Operational
PO – Policy
SI – Special Interest
TE – Technical

Please respond to our survey on sessions you're likely to attend. Use the coupon on page 15, or simply mark up this schedule and mail a photocopy to USTA. Thank You!

*see registration form on page 11

Note: Schedule subject to change

SUPERCOMM ’91 Conference Program

All Sessions Are Free Except Tutorials.

Monday, March 18

Exhibits Closed

9:00 - 12:00
Tutorial - ISDN TE

9:30 - 10:45

1 **MG Primer: Telecom “Buzzwords” – Putting It All Together.** A babble of buzzwords bombards our business. There is SONET/BISDN/FTTC/SS7/MAN/IN etc. Are they related? Do we care? Let’s put it all together.

2 **SI Europe ’92 – How Telecommunications Equipment and Service Suppliers Capitalize on the Emerging Opportunities.** With 1992 rapidly approaching, many telecommunications suppliers are scrambling to establish strategies and partnerships to address the European community.

3 **OP Operational Support Systems.** Implementation of new technologies and services requires the support of new and innovative Operational Support Systems (OSSs). These new systems will be utilized to provision, operate, administer, and maintain a wide range of advanced services for customers.

4 **TE Advanced Intelligent Network (AIN) – Making It Happen.** Discussion explores the products, the service creation capabilities, and the network transition plans required to realize the AIN in the early 1990s.

11:00-12:15

5 **TE Primer: Understanding Fiber Optic Technology.** This session explores different views of fiber-to-the-home evolution in both urban and rural areas. Technologies such as passive optics and digital subscriber line are discussed.

6 **SI Eastern Europe – Developing Telecommunications Needs and Opportunities.** As Eastern Europe emerges, communications needs will assume top priority. How and when equipment and service suppliers should act to pursue opportunities and meet needs will be explored.

7 **MG Network Management Control.** The ability to manage and control modern telecommunications networks is evolving into a multi-faceted and complex task. Companies should ensure survival during failures, effectively control fraud, maintain security, provide self healing capabilities, and provide diverse routing arrangements to satisfy customer needs.

8 **TE Open Network Architecture – What Next?** Even though a major part of the FCC’s ONA structure has been suspended by action of the Ninth Circuit Court, the subject local exchange carriers are continuing plans to implement ONA. This panel examines the conditions under which ONA plans are proceeding and provides insight on views of services purchasers.

1:00 - 4:00
Tutorial - Wireless TE

1:00 - 2:30
Spotlight Panel

2:45 - 4:00

9 **TE Primer: ISDN – The Telecommunications Network of the Future.** This basic presentation describes Integrated Services Digital Network (ISDN) architectures, services, and management. Both the challenges and opportunities provided by ISDN are presented.

10 **SI Mexico, Brazil, and Other Latin Market “Hot Spots.”** Session focuses on privatization and liberalization trends in Latin America, with emphasis on Mexico, Brazil, and the Caribbean Basin (Caribbean Islands – Central America).

11 **TE Evolution of Fiber Optics Technology.** This session overviews emerging architectures and technologies for the next generation of all fiber loops, as well as looking at powering strategies and the result of a fiber-to-the-home trial.

12 **PO Legislative Responses to Infrastructure Development.** This session focuses on the legislative efforts of USTA to remove the barriers to infrastructure development. Panelists from industry and Congress examine the issues of telco-cable, MFJ, and tax.

4:15 - 5:30

13 **TE Primer: LANs/MANs.** This basic seminar covers current and emerging LAN/MAN technologies. Topics include current and future standards, topologies, wide area connectivity options (including bridges and routers), and installation planning.

14 **OP The Role of the End User in Network Management.** Users today wish to assume a greater role in direct management of their voice, data, and video networks – both domestic and international. Carriers, network management experts, and end users explore what is doable today.

15 **MG Quality of Service.** Successful businesses providing products and services recognize customer emphasis on quality in today’s marketplace. A customer’s expectation of quality and satisfaction with products and services includes all aspects of customer/company contacts.

16 **PO Judicial and Regulatory Responses to Infrastructure Development.** Building on the theme established in Panel 12, this session examines efforts of the industry to remove barriers and promote infrastructure development in the courts and the various regulatory agencies at state and federal levels.

Tuesday, March 19

Exhibits Open 10-5
8:30 - 9:00 – Continental Breakfast

9:00 - 10:00
Opening Keynote Session

10:15 - 11:30

17 **TE An Introduction to SONET.** This session addresses evolution, flexibility, and use of SONET on fiber loops and explores the need for monitoring SONET-based networks.

18 **TE Nationwide ISDN – Business Drivers and Implementation Plans.** This session addresses current trends and implementation issues relating to successful deployment of ISDN. Several industry participants present their perspectives for making ISDN a marketplace winner.

19 **MG Small Companies – Meeting the Challenge of New Technology.** How small telephone companies adapt and integrate their services and facilities into the rapidly changing network. Emphasizes how to obtain information, assess its accuracy, and evaluate options.

20 **MK Marketing New Services – Delivering Technology to the Consumer.** Telcos face challenges in marketing new technologies to residential and small business customers. Marketers discuss the roles of regulation, privacy, market research, consumer education, and advertising in marketing CLASS, voice messaging, and other advanced network services.

21 **TE Gigabit Network Research Testbeds.** This session overviews all five NSF/DARPA gigabit network research testbeds and features discussion about two by the testbed participants themselves.

22 **TE North American Numbering Plan Issues.** This session provides an overview of North American Numbering Plan issues including Interchangeable NPA codes, Vertical Service Code Assignment, and exhaust of three digit Carrier Identification Codes (CICs).

1:00 - 2:30
Spotlight Panel

2:45 - 4:00

23 **MG Impact of Wireless Service on the Network.** Personal communications industry panelists discuss developments in and competitive possibilities of wireless communications, including CT-2, second-generation cordless telephones, PCS, and personal communications services using microcell technology.

24 **TE LAN Interconnection – Some Alternatives.** This session discusses the important issues and the LAN interconnection alternatives (frame relay, SMDS^{sm}, ISDN, FDDI, etc.) being considered by the user.

25 **PO Executive Branch Response to Infrastructure Development.** This session completes the trilogy begun in Panels 12 and 16 by examining Executive Branch efforts to promote infrastructure development. Areas of emphasis are the White House and the Treasury and Commerce Departments.

26 **MK Operator Services/LIDB-ABS.** Local exchange carriers are implementing new value-added features and services associated with operator services. Providers of operator services need to be aware of these to assess impact on staffing, provide operator training, and implement new procedures.

27 **MG Videoconferencing Finally Emerges as Powerful Telecommunications Tool.** Like cellular radio, videoconferencing is finally coming into its own. Rapidly declining costs coupled with improved performance make it attractive. This panel explores current service and equipment alternatives based on user experiences.

28 **OP Synergies of EDI, EFT, and Bar Coding in Telecommunications.** A high-level overview of Electronic Data Interchange (EDI), Electronic Funds Transfer (EFT), and Bar Coding applications in the telecommunications industry.

Wednesday, March 20

Exhibits Open 9-5

8:30 - 9:00 – Continental Breakfast

9:00 - 10:00
Second General Session

10:15 - 11:30

29 **TE SONET-Applications.** This session investigates SONET applications using broadband technology with implications on architectures. Use of mid-span meets and network management needs are also addressed.

30 **SI Customer Premise Equipment – More Than a Telephone.** Today the role of the telephone is expanding. Data access, facsimile, video, and interactive telecomputing add new dimensions to CPE. Panelists provide a look at future trends.

31 **PO Infrastructure Issues for the Small Telco.** While Panels 12, 16, and 25 examine barriers to infrastructure development from an industry-wide perspective, this session examines special concerns such development presents to small telcos. Emphasis on their role as part of the public network – such that all telcos and subscribers are provided with the latest technological advances.

32 **MK 800-900 Services – Innovations in Value-Added Inbound Services.** Speakers review competitive issues among inter-exchange carriers in offering 800 services, the status of the Bell operating company 800 database offering, and innovations in 900 services.

33 **MG Telecommunications Billing Challenges for the 1990s.** Various information management billing needs characterizing the telecommunications industry of the 1990s are discussed, including electronic billing and future expectations.

34 **TE Voice Information Services – New Opportunities.** Many manufacturers are energetically directing their efforts to designing a wide variety of voice information service capabilities. This panel provides insight and highlights opportunities for deployment of innovative voice services.

1:00 - 2:30
Spotlight Panel

2:45 - 4:00

35 **MG Cellular and the Wireless Future.** The press is blazing with stories about various wireless initiatives. How real is this activity and where is it taking us? This session covers issues that face mobile service providers and those that future networks are likely to encounter.

36 **TE Industry Perspectives on BISDN Deployment.** Industry activity in Broadband ISDN is moving from the research stage to trials and planning for initial deployment. This session provides industry perspectives on key factors driving initial deployment.

37 **TE Network Strategies – Diversity and Marketability.** This lecture examines the evolution of communications networks, tracing their ascent from tools used to support communications between users and systems to their current status as enterprise-wide, strategic systems.

38 **MK Penetrating the Small Business Market With Centrex Services.** Small business represents the fastest growing group of Centrex users. Representatives from carriers, manufacturers, and end users explore the best way to penetrate the market.

39 **OP Videotex Gateways – Challenges and Opportunities for the Telecom Industry.** This panel tackles business and technical issues involved in gateways, dealing with opportunities for local operating companies, Independents and Regionals, along with an analysis of current activity.

40 **TE SMDS^sm Status Update.** This session provides a status update of the ongoing SMDS work and will feature speakers from an RBOC, an Independent LEC, an IXC, and a CPE vendor.

Thursday, March 21

Exhibits Open 9-3

8:30 - 9:00 – Continental Breakfast

9:00 - 10:00
Third General Session

10:15 - 11:30

41 **OP SS7 Update.** This panel reviews progress made in establishing SS7 connectivity in the past year, issues unresolved, where the Independent community stands concerning implementation, and the outlook for cooperative implementation of SS7 capability in the U.S.

42 **MK Houston Users' Roundtable.** Large Houston-based users discuss their local and long-distance telecommunications services and needs. They share their "wish list" of products, services, tariffs, or joint ventures desired for the public network.

43 **MG Deployment of Digital Cross-connect Systems in the Network.** The Digital Cross-connect System (DCS) has become an important intelligent network element. This session addresses the impact of SONET and BISDN on the utilization and deployment of DCSs in a transitional network.

44 **MK New Product Development – How Is It Done?** In the post-divestiture environment, most local exchange carriers have found it necessary to plan new ventures and services on a more rigorous business basis. This panel presents approaches to development of new business opportunities in the current environment.

45 **OP What's New in Interactive Satellite Communications?** Industry experts provide update on emerging satellite facilities and services, including V-SAT, mobile, and interactive pay-per-view direct broadcast.

46 **MK Facsimile: A Powerful New International Communications Tool.** The facsimile market is exploding. Equipment and service suppliers preview the emerging terminal and service options.

Session Tracks

MG-Management, **MK**-Marketing, **OP**-Operational, **PO**-Policy, **SI**-Special Interest, **TE**-Technical.

Management – Focusing on matters of interest to anyone involved in providing or managing telecommunications services, from senior executives to staff personnel. Nine sessions focus on network control, service quality, wireless services, and videoconferencing, among other topics.

Marketing – The role of marketing across the telecommunications spectrum: promoting new services, new product development, facsimile, Centrex, and 800-900 services, among other topics. Seven sessions formulate marketing plans and hone sales techniques.

Operational – Telecommunications functions such as network management, electronic data interchange, videotex, signaling system 7, and satellites. Six sessions.

Policy – LEC industry responses to challenges in deploying the newest technologies to enhance the nation's telecommunications network. Four sessions focus on infrastructure development and USTA efforts to remove barriers – from an industry-wide perspective and small telco view.

Special Interest – From Eastern Europe and Europe '92 to Mexico/Brazil and other hot Latin American markets, as well as customer premises equipment. Also, opening sessions Tuesday-Thursday morning and spotlight panels at 1:00 p.m. Monday-Wednesday provide special interest focus.

Technical – All areas of telecommunications technology, including switching, transmission, systems, and networks. Highly detailed concepts, developments, applications and new technology are covered in 16 sessions.

Note: Schedule subject to change.

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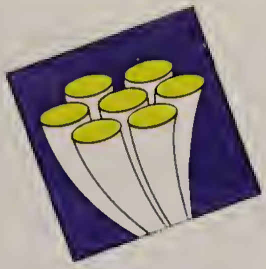
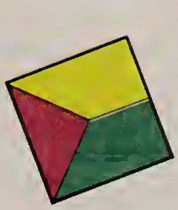
	Tuesday, March 19	Tuesday, March 19	Wednesday, March 20
	11:30 - 1:00 Lunch/Address Greg Hughes, President AT&T’s Network Cable Systems	**2:30 - 2:45** Coffee Break	**11:30 - 1:00** Lunch/Address Royce Holland, President Metropolitan Fiber Systems
Technology and Product Trends	**1:00-2:30** A1 **The Digital Loop Carrier Revolution.** This lively roundtable discussion also gives the audience the opportunity to quiz today’s major DLC vendors. This session will examine the transition from TR-008 standards to TR-303 and SONET and whether it will accelerate the drive for fiber-to-the-home. The panel and audience will discuss vendors’ timetables for SONET and CO switch compatibility, ease of upgrades, reliability, and new service opportunities. **Moderator**: Rick Maciel, Technology Consultant-Integrated Technology & Planning, Pacific Bell. **Overview:** Achmad Chadran, Senior Analyst, Northern Business Information.	**2:45-4:15** A2 **Beyond Digital Cross-Connects**. Session continues the inquiry into the evolving DLC and DCS technologies. Participants will discuss interconnection and switch integration and will quiz vendors about their plans to support telcos during the transition from asynchronous to synchronous networks and to establish platforms that provide dynamic provisioning, control, maintenance, and services and facility restoration. **Moderator:** Ray Ritchie, Division Manager-Network Planning Requirements, Bellcore. **Overview:** Roger Story, District Manager, Cross-Connect Systems, Bellcore.	**1:00-2:30** A3 **Video Services–*Now.*** Meet members of the joint BOC and Bellcore Video Task Force and take a look at the big picture for this lucrative new revenue stream. Discussions will focus on planned and ongoing trials; standards and solutions for transition from narrowband to broadband, including HDSL/ADSL development; and low bit rate coding. **Moderator:** Charles Judice, Division Manager of Speech & Image, Bellcore. **Overview:** Bekir Serbetcioglu, Vice President of Technology, EBS.
Marketing and Management	**1:00-1:45** B1 **Economic Opportunities & Constraints.** What’s the real-world timeframe for the shift to an all-fiber network? How will it affect telco investment in OSP, the drive to cut plant operating expenses, and the job responsibilities of thousands of OSP professionals in our industry in the coming few years? **Speaker**: Louis A. Kemnitz, Management and Technology Consultant, Cincinnati Bell Information Systems. **1:45-2:30** **Craftspeople and the Network of the 90s**. How fiber and SONET are blurring the distinction among CO, OSP, and transmission, and what fiber and OSP professionals can do to ensure they are ready for job changes. **Speaker**: To be announced.	**2:45-4:15** B2 **Managing the Transition from Copper to Fiber**. An opportunity to hear how vendors plan to help telcos make the least painful transition from copper to fiber and to quiz vendors on their solutions to help buoy telcos’ bottom line while meeting telco needs, OA&M requirements, and depreciation woes. **Moderator:** Paul Hart, Vice President-Technical Disciplines, USTA.	**1:00-2:30** B3 **Fiber Competition: The New Carriers.** A new force is emerging in the local loop as business users look for higher capacity services, faster provisioning, and lower prices: the local loop entrepreneur. And they are building fiber backbone networks in every major city in the United States and competing head-to-head with telcos. Participants will discuss how the telcos are responding to new local private line competition and hear from both sides of the fiber fence. **Moderator** and **Overview:** Steve Titch, News Editor, *Telephony*
OSP Strategies for the Future	**1:00-2:30** C1 **Power Strategies for the Local Loop.** Discussion focus is on the pros and cons of abandoning backward compatibility to electromechanical telephones during an emergency outage.Telcos and vendors will also discuss the technological, regulatory, and business issues fueling telcos’ powering strategies, and the reliability, time and cost cycles and safety of today’s power alternatives, including CO/CEV power plants, local backup power, and power to the curb. **Moderator:** Tom Taylor, District Manager, Energy Systems Technology, Bellcore. **Overview:** Frank Tuhy, District Manager, DLC & Criteria, Bellcore.	**2:45-4:15** C2 **Fiber Restoration with Texas A&M.** A rare opportunity for a hands-on demonstration and comprehensive, condensed course in latest techniques for mechanical and fusion splicing and connectorization, which will also feature practical field tips to solve problems that–in theory– won’t happen. **Moderator:** Dr. Harold Sobol, Professor Electrical Engineering & Associate Dean of Engineering, Texas A&M.	**1:00-2:30** C3 **The Economics of Fiber: New Growth Areas & Rehab.** Telcos and vendors assess how lessons learned so far can help them work together more efficiently to meet the challenges of loop diversity, customer demands, and legislative conditions in the 1990s. The discussion features solutions to help loop planners meet the immediate demands of new growth areas and strategies for an economical evolution from copper to an all-fiber network. Participants will examine site planning, current and future architectures, relief intervals, and cutover strategies. **Moderator:** Michael Warr, Technical Editor, *Telephony*. **Overview:** John Ryan, Vice President., Fiber Optics Group, Electronicast.





Wednesday, March 20

2:30 - 2:45
Coffee Break

2:45-4:15

A4 **Passive & Active Optical Networks.** Telco and vendor perspectives of the economics of passive and active optical networks, including economic and operational benefits, architectural choices and power, splitting ratios, control, and operations systems interfaces. **Moderator:** Carol Wilson, Editor, *Telephony*. **Overview:** Raymond F. Albers, Assistant Vice President - Technology Planning, Bell Atlantic.

2:45-4:15

B4 **Applications & Drivers: Fiber in the Loop.** The discussion focuses on the drivers and applications that will necessitate deployment of fiber in the distribution plant to residential and business users: What are perceived user needs? What are telecom operating companies' prognosis of the essential business and residential service requirements? Is fiber in the distribution plant really necessary to CATV companies? How will the CPE industry and terminal equipment shape the future? What major discontinuities are looming that could change the fiber in the loop business? **Moderator** and **Overview:** Dick Skillen, Assistant Vice President - Product Line Management, Northern Telecom.

2:45-4:15

C4 **Fiber Restoration with Texas A&M.** A rare opportunity for a hands-on demonstration and comprehensive, condensed course in latest techniques for mechanical and fusion splicing and connectorization, which will also feature practical field tips to solve problems that–in theory– won't happen. **Moderator:** Dr. Harold Sobol, Professor Electrical Engineering & Associate Dean of Engineering, Texas A&M.

Thursday, March 21

11:30 - 1:30
Lunch/Address and Wrap-up Session
Richard Snelling, Executive Vice President - Network, Southern Bell

3:00 - Exhibits Close

SUPERCOMM Tutorials

ISDN

Monday, March 18 - 9:00-12:00

ISDN is more than the latest transport and switching technology, more than new terminal equipment, more than new access techniques to reach interexchange or data carriers.

ISDN represents the first major step by telcos to provide integrated, intelligent, digital communication services to customers worldwide. It is an evolutionary step affecting voice, data, and signaling networks.

This tutorial provides a broad overview of ISDN, covering many subjects. It provides an update for anyone interested in the topic, and should also be understandable by novices.

Presenter: Howard Scott, MTS, ISDN Project Management, Bellcore.

Wireless

Monday, March 18 - 1:00-4:00

This tutorial provides an introduction and broad understanding of the various elements of wireless telephony - BETRS, cellular and personal communications systems (PCS).
In BETRS (Basic Exchange Telecommunications Radio System), radio is used as a flexible and economical distribution technology to serve remote geographical areas. Cellular and PCS exploit the unique opportunity of radio to provide ubiquitous communication to people "on-the-move".

Subject matter experts lecture on technical aspects and serving arrangements of the various participants. Future outlook and impact of regulatory activity are addressed.

Speakers: H.W. (Pete) Arnold, Dis. Mngr.-Radio Techniques, Bellcore; L.G. (Larrie) Sutliff, Dis. Mngr.-Regulatory Research and Technical Analysis Group, Bellcore; S.H. (Sing) Lin, Dis. Mngr.-Digital Radio, Bellcore; plus a cellular speaker to be chosen.

SUPERCOMM '91 Tutorial Fees: $75.00 each/per person. Use the form on this page to register.

Registration Form for Fiber Perspectives '91 and/or SUPERCOMM Tutorials

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Pacific Telecommunications Council Conference

Tuesday, March 19

PTC offers a one-day program on telecommunications development in the Asia-Pacific region. Rapid growth of basic and advanced facilities, overnight development of new services, and the ensuing utilization of information services are remarkable. The Asia-Pacific region has the highest economic and telecoms growth rate in the world. Sessions also will cover regional marketing and effects of globalization.

8:00-10:00 **Registration/Packet Pick-up**

10:05-11:25
Session I: Facilities Overview. Panel on the current state of telecommunications development in the Asia-Pacific region, focusing on current capacity and future infrastructure. **Chair:** Robert Engelbardt, Pres., PTC and V.P., Hicks & Ragland Engineering Co., Honolulu. **Panelists:** John Cotter, Mng. Dir., AT&T Communications Pacific, Inc., USA; Robert Craver, Dir. of International Services, GTE Hawaiian Tel, Honolulu; James Johnson, Jr., Reg. Dir. - Asia/Pacific, INTELSAT; Diana Sharpe, Atty., Sly & Weigall, Sydney, Australia.

11:30-12:45
Session II: Services & Applications Overview. Panel on the region's existing and planned information services, such as financial, educational, teleconferencing, satellite, and EDI. **Chair:** Teresa Buczkowska, Prof. of Electrical Engineering, Univ. of Technology, Sydney. **Panelists:** American Express International, Hong Kong; Steve Baruch, Atty., Leventhal, Senter & Lerman, USA; George Darby, Atty., Law Offices of George E. Darby/Pres., Eidectic Technology, Inc., Honolulu.

12:45-2:00
Luncheon Speaker: Dr. Joseph Pelton, Dir., Telecommunications Program, Univ. of Colorado, Boulder; Dr. Pelton, author of the book "*Future Talk: Global Life in the Age of Telepower,*" to address "Future Talk" in Asia-Pacific.

2:00-3:30
Session III: Marketing in Asia. Panel to focus on Asia-Pacific market potential, access to the market, and how to sell abroad. **Chair:** George Lissandrello, V.P.-Sales and Marketing, Intelec, Inc., Richardson, Texas. **Panelists:** Gary Anderson, Pres., RF Monolithics, Dallas, Texas; Denny d'Alelio, Dir. of Int'l. Marketing, SYSCON Corp., USA; Mark Hukill, Lecturer, Ngee Ann Polytechnic, Singapore; Indu Singh, Dir. of Technology Impact, James Martin Associates, USA.

3:30-4:00 **Coffee Break**

4:00-5:30
Session IV: Joint Ventures/Strategic Alliances. Panel on privatization, joint ventures, strategic alliances, and globalization of telecom industry. **Chair:** Frank Urbany, Dir. of Int'l. & Agency Relations, BellSouth International, Washington, D.C. **Panelists:** Tedson Meyers, Partner, Reid & Priest, Washington, D.C.; North Pacific Cable, Vancouver, Washington; Dr. Delbert Smith, Partner, Schnader, Harrison, Segal & Lewis, Washington, D.C.; Kenneth Volz, Dir. of Strategic Investments, Ameritech International, Chicago, Illinois.

Caribbean Telecommunications Council Conference

Wednesday, March 20

The CTC conference focuses on developments involving regional marketing, cellular applications in rural areas, disaster recovery and computer graphics.

9:00-10:15 **Registration**

Morning Chair: Luis La Rocca, Pres., CTC and Dir. Caribbean and Central America, BellSouth International, Atlanta, Georgia.

10:15-11:30
Regional Marketing in the Caribbean, Central & South America. Marketing panel on revenue enhancements utilizing 800 services, telemarketing, and Yellow Pages. Optimize your opportunities by gaining insight into major strategies used in the international telecommunications marketplace. **Moderator:** Anthony Hart, Mng. Dir., Cable and Wireless, Tortola, BVI. **Panelists:** Donna Brooten, Prod. Market Mngr., AT&T, Basking Ridge, New Jersey; Tom Alexander, Oper. Mngr., Southern Bell, Atlanta; Ivan Dominguez, Gen. Mngr., ITT Intermedia, San Juan, Puerto Rico; Lawrence Kenny, Mngr., Coopers & Lybrand, Atlanta.

11:30-12:45
Cellular Applications in Rural Areas. A cellular network can be used in many ways; one of the most effective is in those rural pockets where a land line system would be financially prohibitive. **Moderator:** Ernesto La Russa, V.P., CTC and Dir. Int'l. Affairs, AT&T, San Juan. **Panelists:** William King, Pres., Cellular Communications, San Juan; Jorge Merino, Tech. Gen. Mngr., CIDCOM, Santiago, Chile; Luis Romero Font, V.P., Codecom, San Juan.

12:45-2:15
Luncheon: Courtesy BellSouth International. **Speaker:** Helmut Paul, Dir. for Latin America, International Finance Corp., Washington, D.C.

Afternoon Chair: Phoebe Forsythe Isales Esq., Exec. Dir., CTC and Legal Consultant to AT&T of Puerto Rico, San Juan.

2:15-3:45
Disaster Recovery Using Satellites. Mother Nature can shock us with earthquakes, fires, hurricanes, tornadoes, floods, and volcanoes. Learn how you can be better prepared to continue providing communication services by satellite. **Moderator:** Felipe Noguera, General Secretary, Caribbean Assoc. of National Telecommunication Organizations (CANTO), Port of Spain, Trinidad, West Indies. **Panelists:** Dr. Delbert Smith, Author, Partner, Schnader, Harrison, Segal & Lewis, Washington, D.C.; Barry Pasternak, V.P. Engineering, Carbisat, Ft. Lauderdale, Florida; Cable & Wireless speaker to be announced.

3:45-4:00 **Coffee Break:** Courtesy AT&T of Puerto Rico.

4:00-5:15
Outside Plant Planning Using Computer Graphics. Applications of facility management systems for automated mapping and facility management of the telecommunications network. There will be a demonstration. **Moderator:** Rafael Lemus, Exec. Dir., COMTELCA, Tegucigalpa, Honduras. **Panelists:** B.J. Neely, Sen. Mrk. Mngr., Telephone Applications, Intergraph, Huntsville, Alabama; Frank Castelberry, Mngr., Southern Bell, Atlanta; Paul Alley, Mngr. Computer Graphics, Codetel, Santo Domingo, Dominican Republic; Telebras, Brazil speaker.

Preliminary programs subject to change.

Registration Form for the Asia-Pacific and Caribbean Conferences

Name ☐ Mr. ☐ Ms. ☐ Dr. ____________________
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Telephone: 1-808-941-3789
Facsimile: 1-808-944-4874

For CTC Conference, mail form and payment to:

Caribbean Telecommunications Council
c/o AT&T
954 Ponce de Leon Ave., 6th Floor
Santurce, PR 00907

Telephone: 1-809-729-2742
Facsimile: 1-809-725-6624

Note: No refunds after February 15, 1991.

Learn from the Experts

SUPERCOMM '91 brings together the top professionals of the telecommunications industry from A to Z. They'll give you all the hard data you'll need to get on top and stay there. It's a gathering of forces you won't want to miss. The following is just a partial list of professionals on the program:

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Housing and Registration Information

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Fill out this registration and housing form today for SUPERCOMM '91. All forms will be mailed to Rogal America (address on page 15). To handle housing questions on-site, Rogal will have a booth located in the Registration Area, George R. Brown Convention Center.

Housing

A portion of each hotel's room block has been set aside for attendees. At the Hyatt Regency Houston, no more than 15 rooms will be allotted to any one company. At the Four Seasons Hotel, no more than 10 rooms will be allotted to any one company.

Hotel Deposits

A hotel deposit is required for each hotel room/suite requested. The deposit must be submitted with the Official Housing/Registration Form. Forms are date stamped and processed on a first-come, first-serve basis. All rooms must have a deposit in the amount of one night's lodging. The deposit may be with a major credit card or check payable to "Rogal America, Inc." (except where noted under Hotel Information).

Hotel Confirmations/Changes

Hotel reservation acknowledgements will be sent directly to you from Rogal. Any hotel changes, substitutions, or cancellations must be made directly through Rogal. Do not contact the hotels directly. Hotel cancellations can be made by mail, FAX 617/965-2729 or Telex 413053 ROGALAM, or call 617/965-8000 or 1-800-553-0505.

Badges

Badges will be mailed (USA only), so provide the correct mailing address for EACH registrant. You will receive your badge approximately 2 weeks prior to the show. If you do not receive your badge, please register on-site.

Foreign and Canadian badges will not be mailed. A special booth will be provided for pick-up of these badges in the Registration Area of the George R. Brown Convention Center.

Missed Deadline

Forms received after the SUPERCOMM '91 deadline of Feb. 15, 1991 will be handled in two ways:

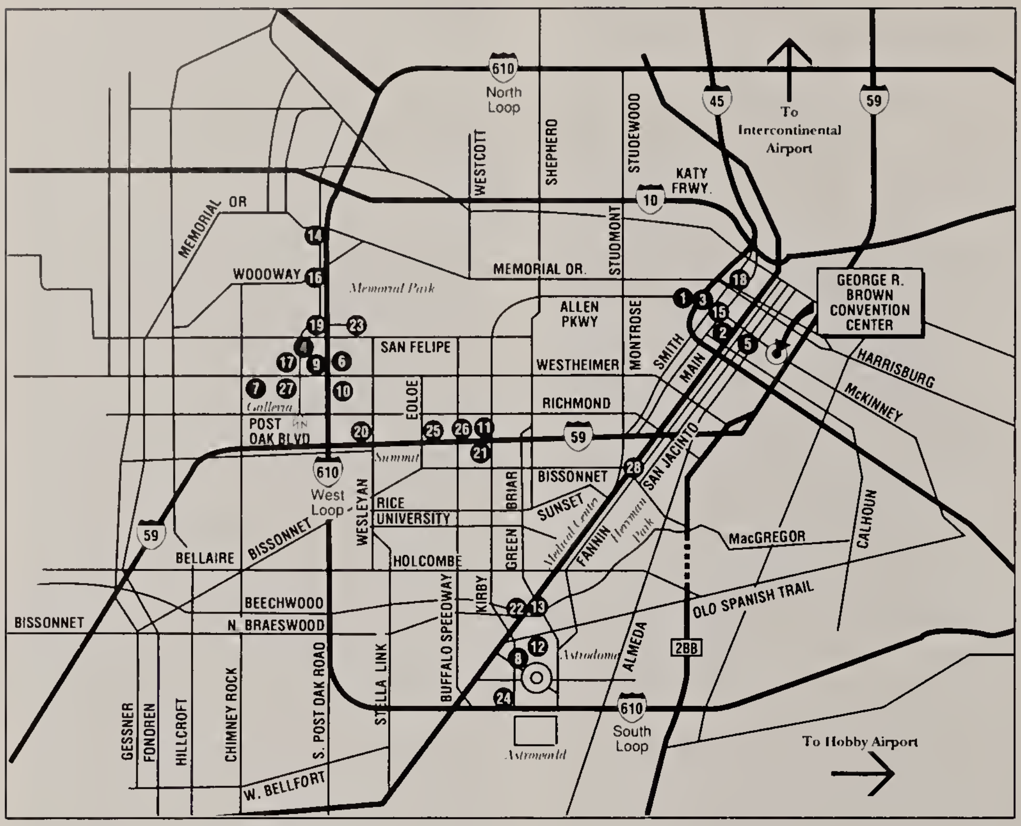
HOUSING: Rooms will be assigned on a space available basis.

SHOW REGISTRATION: Registrants whose forms are received after Feb. 15 will be asked to register on-site.

Shuttle Bus

Shuttle Bus service will be provided between all SUPERCOMM '91 hotels and the George R. Brown Convention Center on March 18-21, 1991.

Housing and Registration Information (con't.)



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#	Hotel Information	# of Units	One Person	Two Person
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3	** Doubletree, Allen Center 400 Dallas St.	225	$104	$119
4	Doubletree, Post Oak 2001 Post Oak Blvd.	250	$105	$115
5	Four Seasons Hotel 1300 Lamar St.	250	$120 $135 $160	$140 $155 $185
6	Grand Hotel 2525 W. Loop South	200	$ 70	$ 80
7	Guest Quarters 5353 Westheimer Rd.	175	$109	$109
8	Holiday Inn, Astrodome 8111 Kirby Drive	150	$ 68	$ 78
9	Holiday Inn Crowne Plaza 2222 W. Loop South	350	$ 90	$ 98
10	Holiday Inn Galleria 3131 W. Loop South	250	$ 65	$ 65
11	Holiday Inn Greenway Plaza 2712 Southwest Fwy.	225	$ 76	$ 86
12	Hotel Luxeford Suites 1400 Old Spanish Trail	125	$ 67	$ 77
13	Houston Marriott, Astrodome 2100 S. Braeswood Dr.	250	$ 85	$ 95
14	The Houstonian Hotel 111 N. Post Oak Lane	100	$120	$130

* Accepts ONLY check or money order as 1st night deposit.
**Accepts ONLY American Express or check/money order as 1st night deposit.

#	Hotel Information	# of Units	One Person	Two Person
15	Hyatt Regency Houston 1200 Louisiana St.	750	$120	$135
16	Inn on the Park Four Riverway	225	$150	$180
17	J.W. Marriott Houston Galleria 5150 Westheimer	350	$105	$115
18	The Lancaster Hotel 701 Texas Ave.	34	$145	$145
19	Marriott, West Loop 1750 W. Loop South	150	$118	$118
20	Quality Inn-Greenway Plaza 4020 Southwest Fwy.	150	$ 50	$ 60
21	Ramada Inn-Greenway Plaza 2929 Southwest Fwy.	150	$ 45	$ 45
22	Residence Inn 7710 S. Main Street	100	$ 75	$ 75
23	The Ritz-Carlton 1919 Briar Oaks Lane	125	$122	$137
24	Sheraton Astrodome Hotels 2350 S. Loop West	600	$ 68	$ 78
25	* Stouffer Presidente 6 Greenway Plaza East	250	$103	$115
26	Travelodge Viscount 2828 Southwest Fwy.	150	$ 52	$ 62
27	Westin Galleria Westin Oaks 5060 W. Alabama	400 300	$120 $120	$130 $130
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Advance Registration/Housing Request Form

1. Check ONE category that best describes your INDUSTRY AFFILIATION
(also enter on line 3e)

Exchange Carriers/Subsidiaries
10 ☐ Bell Holding Companies
11 ☐ Bell Operating Companies
12 ☐ Independent Holding Companies
13 ☐ Independent Operating Companies
14 ☐ Foreign Telcos

Non-Operating Telco Subsidiaries
15 ☐ Bell
16 ☐ Independent

Other Carriers
17 ☐ Long Distance
18 ☐ International
19 ☐ Mobile/Cellular
20 ☐ CATV/Radio/TV

Other Telecom Providers
21 ☐ Telecom Manufacturers
22 ☐ Dealers & Distributors
23 ☐ Contractors & Electrical Services
24 ☐ Consultants & Architects
25 ☐ Financial & Leasing Companies
26 ☐ Data Communications Equipment Manufacturers
27 ☐ Data Communications Services
28 ☐ Telecommunications Associations

Telecom Users
29 ☐ Educational
30 ☐ Financial/Investment
31 ☐ Hospitals/Health Care
32 ☐ Hotel/Motel
33 ☐ Legal/Insurance/Real Estate
34 ☐ Publishing
37 ☐ Research & Development
38 ☐ Stadiums/Convention Centers
39 ☐ Trade (Retail/Wholesale)
40 ☐ Transportation/Pipelines
41 ☐ Utilities (Gas/Water/Electric)

Government
42 ☐ Government/Regulatory
43 ☐ Military
44 ☐ Foreign

Other
46 ☐ Press
50 ☐ Spouse/Child (non-industry)
51 ☐ Other (please specify)__________

____

REGISTRATION FORMS:
To register for the following events, refer to the page indicated. "Fiber Perspectives '91" - pg. 11; SUPERCOMM '91 Tutorials - pg. 11; Pacific Telecommunications Conference - pg. 12; Caribbean Telecommunications Conference - pg. 12.

2. Check ONE that best describes your professional responsibility
(also enter on line 3e)

A ☐ Corporate/Administrative
B ☐ Sales/Mkt./Customer Services
C ☐ Human Resources
D ☐ Engineering
E ☐ Network Operations
F ☐ Research & Development
G ☐ Central Office
H ☐ Transmission
I ☐ Cable & Wire
J ☐ Voice/Data Mgmt.
K ☐ Mobile/Cellular Comm.
L ☐ Support Services
M ☐ Fiber Optic Operations
N ☐ Other (please specify)__________

Please make copies if necessary.
Mail completed registration form(s) to:

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SUPERCOMM '91
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Conference Dates:
March 18-21, 1991

Exhibit Dates:
March 19-21, 1991

Pre-Registration Deadline:
February 15, 1991

3. Registration and/or Housing Reservation
Whether or not you use hotel accommodations, please fill in to pre-register.
Please print.

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Last First (no initials) Nickname for badge
b. Title/Department ______________________________
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Telephone (   ) ____________ FAX (   ) ____________
e. Industry Affiliation ____________ Professional Responsibility ________
(Use number from #1) (Use letter from #2)
f. HOTEL PREFERENCE: 1st ______________________________
2nd ______________________ 3rd ______________________
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h. Arrival Date ______________ Departure Date ______________
i. Name of Second Occupant ______________________________
(Complete a registration form for this person.)
j. Payment by: ☐ check ☐ Visa ☐ MasterCard ☐ American Express
Credit Card # ______________ Card Exp. Date ______________
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k. Hotel Not Required ☐

- -

Help Us Help You

We'd like to make your comfort our priority, by scheduling room sizes based on session popularity. Please fill in the number of the SUPERCOMM '91 Primers/Seminars and/or check off any other events you plan to attend. Return to Henry Wieland, Executive Director - Special Events, USTA, 900 19th Street, N.W., Suite 800, Washington, D.C. USA, 20006-2190. Thank You!

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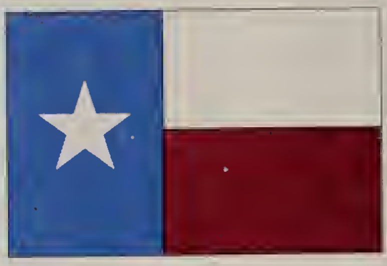
Spotlight Panels:
☐ Mon. ☐ Tues. ☐ Wed.
Tutorials:
☐ ISDN ☐ Wireless

☐ PTC Conference ☐ CTC Conference

Fiber Perspectives '91:
Lunch/Lecture: ☐ Tues. ☐ Wed. ☐ Thurs.

Sessions:	A1	A2	A3	A4
(circle)	B1	B2	B3	B4
	C1	C2	C3	C4

Houston: A World-Class Experience



Deep in the heart of every Texan, pride is on the up and up. Texans cater to visitors in a big way. But that's not unusual. They do everything in a big way. Houston's beautiful new George R. Brown Convention Center is a perfect example. So are the fine hotels throughout the city.

Culturally, Houston is one of only four U. S. cities to have its own company in each of the performing arts. The Museum of Fine Arts is one of the country's most outstanding art institutions. A permanent collection includes Van Gogh's *The Rocks* and Rogier van der Weyden's *Virgin and Child.*

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"I think 3Com [Corp.] took the right medicine to straighten out its problems in the LAN Manager market, but the company still has a lot of customer support issues to work out. Even the right medicine can taste nasty sometimes."

Shirley Hunt
Industry analyst
Dataquest, Inc.
San Jose, Calif.

People & Positions

Banyan Systems, Inc. last week announced the formation of an executive marketing team that includes two former Novell, Inc. executives.

The new team is designed to increase the local-area network maker's market presence.

The marketing team was formed by **Jim D'Arezzo,** who joined Banyan as the company's vice-president of marketing in July 1990.

Members of the team include:

- **Duane Bowman,** director of product marketing, who will have marketing responsibility for all of Banyan's software products.

  Previously, Bowman was director of business planning at Novell, where he managed the company's new business ventures, marketing strategy and new product development.
- **Edward Cooper,** director of channel and industry marketing, will have the marketing responsibility for Banyan's distribution channels.

  Previously, he was senior director of worldwide marketing at Novell.
- **Bill Johnson,** formerly Western Digital Corp.'s director of LAN marketing, has been appointed to the position of director of business development for Banyan. ◪

Ex-DG staffers forge ahead with net software project

Form firm to continue HyperDesk development.

By Ellen Messmer
Washington Correspondent

WESTBOROUGH, Mass. — A former Data General Corp. software design team has founded a new company, dubbed HyperDesk Corp., to continue development work on software that will simplify user access to data and peripherals across networks.

Release of the first version of HyperDesk — based on a software development approach called distributed object management — is planned for the second quarter of 1991, company executives said last week.

HyperDesk will enable application developers to build in links to other applications and data bases that are identified as objects, thus alleviating the task of writing source code to establish the links.

Last August, when DG informed the 16-member design team that it could no longer afford to fund the HyperDesk project, the team, with DG's blessing, began the hunt for a new sponsor. They found a backer last December in Tokyo-based ASCII Corp., which purchased the HyperDesk copyright and set up the new company to bring to market the HyperDesk software, already three years in the making.

"It provides a higher level platform that allows developers to tie applications together across the network," said Joseph Forgione, HyperDesk's vice-president of sales and marketing and formerly DG's director of distributed applications architecture marketing. "It's a problem solvable today, but not easily solvable across multiple systems."

Forgione said HyperDesk, which is scheduled to be offered this spring as an OEM product, will be available for DG's AViiON line of Unix-based workstations operating on Transmission Control Protocol/Internet Protocol networks. Later versions are expected to support Microsoft Corp.'s LAN Manager and Novell, Inc.'s NetWare.

Forgione said the company does not plan to support Open Systems Interconnection.

HyperDesk is striving to have a Sun Microsystems, Inc. scalable processor architecture workstation version available as well. Other hardware platforms to be supported include OS/2, DOS and Apple Computer, Inc. Macintosh, said Forgione, although shipping dates remain undefined.

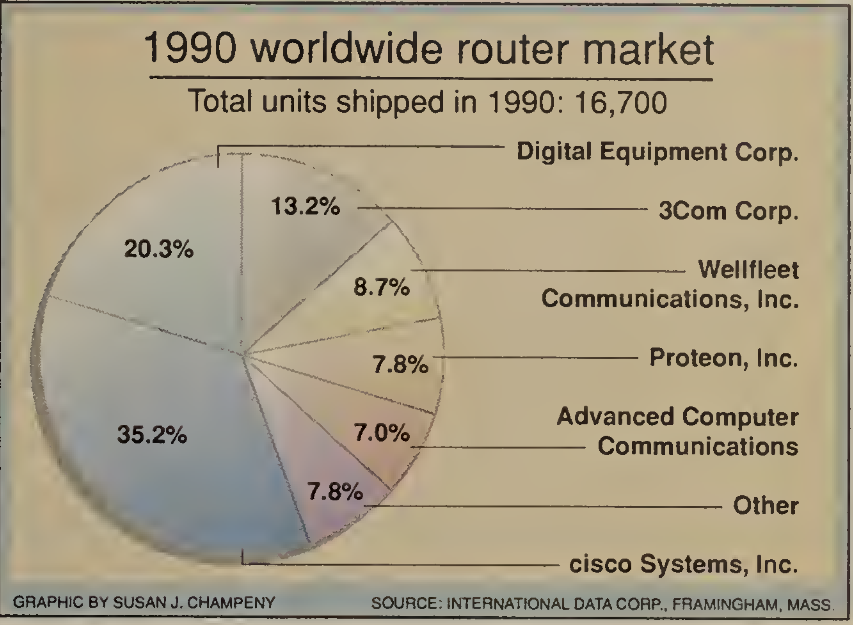
This week, the company submitted the underlying HyperDesk communications technology to the Object Management Group, an 108-member Framingham, Mass.-based consortium seeking to define a set of industry standards for a distributed object management scheme. ◪

INDUSTRY BRIEFS

Tigon buys competitor. Tigon Corp. last week said it has acquired rival voice-messaging services provider GTE Telemessager for several million dollars. Exact terms of the deal were not disclosed. The acquisition pairs Tigon with one of its chief competitors in the emerging voice-messaging services market. Tigon will acquire all 40,000 of GTE Telemessager's customer accounts. Tigon previously had as many as 120,000 users, according to industry estimates. With GTE Telemessager, Tigon said it will increase the number of cities that have local access to its services, thus enabling customers to place a local phone call to send and receive voice messages.

X terminal maker posts gains. Network Computing Devices, Inc. last week posted revenue of $52 million, up more than 300% over last year's sales of $15 million. The privately held company said that since 1988, it has shipped 29,000 X terminals conforming to the industry-standard X Window System, with 20% of those sales coming from OEM agreements with such companies as Data General Corp. and Motorola, Inc.

Italian firm to sell Newbridge muxes. Newbridge Networks, Inc. last week said ITALTEL Societa Italiana Telecommunicazioni S.p.A. will market Newbridge's MainStreet T-1 multiplexers in Italy under the Fleximux brand name. ◪



GRAPHIC BY SUSAN J. CHAMPENY SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

3Com's new focus brings challenges

Analysts question distribution strategy, say vendor needs more powerful, flexible internet products.

By Bob Brown
Senior Editor

SANTA CLARA, Calif. — Industry watchers cheered 3Com Corp.'s recent decision to refocus its efforts on the internetworking market but warned that the company has some catching up to do with top players in that arena.

3Com two weeks ago announced that it would abandon the net operating system and server business and focus on internetworking, connectivity and adapters ("3Com bows out of LAN software mart," *NW,* Jan. 14).

But in order to prosper in that market, 3Com needs to deliver internetworking products that support higher speeds and a wider array of protocols, observers said. Also, 3Com may have trouble with its strategy of selling complex networking systems through the reseller channel.

"3Com is focusing on the right markets," said Tom Erickson, a research analyst at Wessels, Arnold & Henderson, a brokerage firm in Minneapolis. "The question that remains unanswered is whether they have the right products and distribution strategy."

"We want to help our users design and build systems that go literally from the adapter, up through the hub and out through the net, and provide bridging, routing and gateway solutions all tied together by net management," said Bobbi Murphy, director of marketing for 3Com's Networks Systems Division.

3Com garnered less than 10% of its revenues from network operating system sales. In addition, the server business is becoming dominated by makers of powerful multiprocessor systems.

"On the hardware side, 3Com was going up against Compaq [Computer Corp.] and IBM, while it faced Novell and Microsoft [Corp.] on the software side," said Rick Kimball, an analyst at Montgomery Securities, Inc., a brokerage firm in San Francisco. "Those are giants; 3Com isn't."

3Com entered the internetworking market early when it merged with internetworking pioneer Bridge Communications in 1987. Last year, 3Com rolled out its line of NetBuilder bridge/routers and formed a partnership with SynOptics Communications, Inc. under which 3Com is reselling SynOptics hubs as its LinkBuilder line.

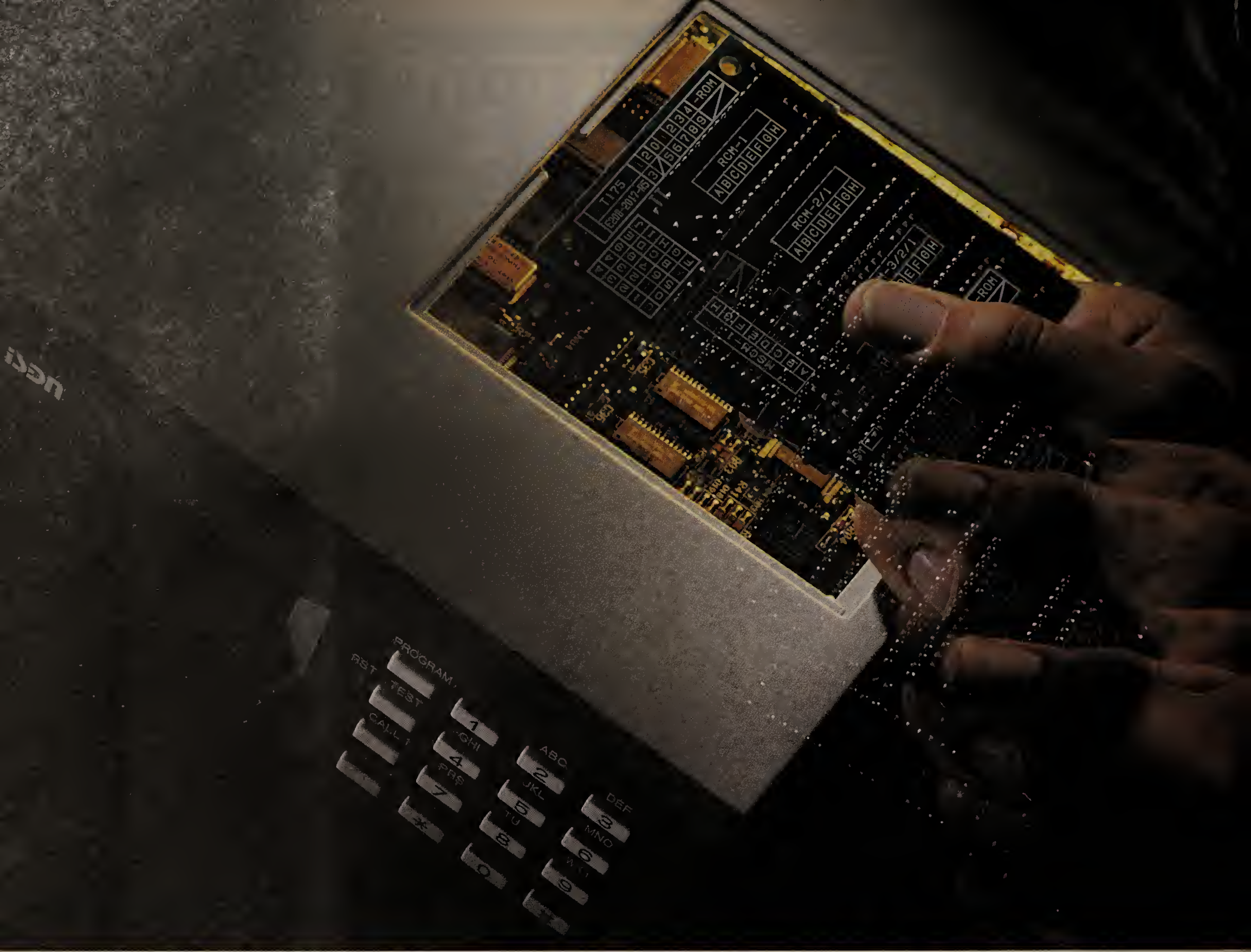
3Com may have trouble selling complex networking systems through resellers.

▲▲▲

3Com already has a significant installed base of internetworking products, according to a new report, "1990 Analysis of the Internetworking Market," by International Data Corp. (IDC), a Framingham, Mass., market research firm. For example, the report ranked 3Com as the third largest vendor in the router market, which nearly doubled in size from 1989 to 1990, when it reached $205.1 million (see graphic, this page).

"Internetworking is definitely

(continued on page 44)



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See The FAXNeT Form on Page 28

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

The number of installations of fiber in the local loop may reach seven million by 2000 and account for 99% of the public network by 2025, according to a recent Bell Communications Research *Digest* story. Bellcore is a research group owned jointly by the seven regional Bell holding companies.

Carrier Watch

US Sprint Communications Co. recently announced the completion of an advanced technology center/government systems sales office in Washington, D.C. that is expected to open this spring.

About 160 employees will move from US Sprint's Government Systems Division headquarters in Herndon, Va., to the new facility.

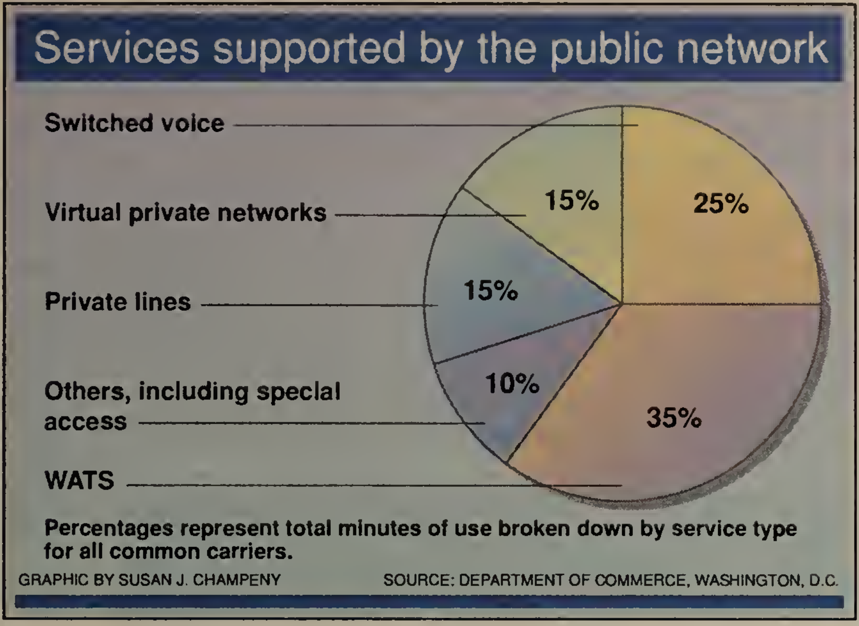
According to a US Sprint spokesman, the move was warranted by a need to be closer to government customers and growth at the Herndon location, which is shared with the carrier's General Services Administration group.

The carrier will use the technology center portion of the facility to demonstrate new technologies, products and services for government and private sector executives as well as network managers.

Artel Communications Corp. recently announced a master purchasing agreement with **Metropolitan Fiber Systems, Inc. (MFS)** that covers Artel's line of fiber-optic video and computer graphics transmission products.

MFS will use the Artel products to deliver fiber-based video services for teleconferencing, imaging and broadcast applications to its customers.

Both companies declined to estimate the potential value of the agreement. ⊡



Services supported by the public network

Percentages represent total minutes of use broken down by service type for all common carriers.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: DEPARTMENT OF COMMERCE, WASHINGTON, D.C.

Health products firm signs net deals with MCI, AT&T

Retains MCI for voice net, AT&T primarily for data.

By Anita Taff
Washington Bureau Chief

DEERFIELD, Ill. — Baxter International, Inc., one of the world's largest suppliers of health care products and services, recently put the finishing touches on two multimillion-dollar network deals for voice and data services.

Baxter signed a three-year $36 million deal for Vnet, 800, calling card and data services with MCI Communications Corp., as well as a three-year AT&T Tariff 12 deal primarily for data services but including Software-Defined Network and 800 services.

The MCI contract is a renewal of a three-year contract signed in 1988. The AT&T contract represents a consolidation of existing network services, said Baxter officials.

Baxter, which reported $8 billion in sales last year, provides about 120,000 products and services to two-thirds of the 6,000 hospitals in the U.S. The company has grown increasingly dependent on its network to cut costs and improve customer service, according to Ergin Uskup, vice-president of corporate information systems at Baxter.

"Everybody knows the problems hospitals are going through. Our business is to help them cut costs," Uskup said. "We're looking for ways to leverage our resources, including the network, to differentiate ourselves in customers' eyes."

Two of the company's systems designed to provide better customer service are ASAP, an electronic data interchange system that allows hospitals to place orders electronically, and Valuelink, a just-in-time inventory system, Uskup said.

With network-based services becoming increasingly important, Baxter implemented a detailed strategy for getting the best transmission services and rates. The strategy called for use of virtual network services rather than a private network due to the extremely low level of internal voice traffic.

Ken Yorgensen, director of corporate communications at Baxter, said only about 15% of the firm's voice traffic is for internal communications.

Baxter, which is primarily an AT&T user, decided to turn about 40% of its traffic over to another carrier. "When you have two carriers, you facilitate a more competitive environment," he said.

Yorgensen said MCI won the bid primarily due to cost savings and the features it could offer through Vnet.

> "We're looking to leverage our resources, including the net, to differentiate ourselves."
>
> ▲▲▲

According to Uskup, Baxter decided to renew its contract with MCI because the carrier was able to provide high-quality cost savings and was willing to be flexible.

"The bottom line is that MCI has shown a lot of flexibility in providing products to Baxter," Yorgensen said.

For example, Baxter is a highly decentralized company and needed to have bills sent to a vari-

(continued on page 12)

D.C. tries to regulate enhanced services

Public services commission ruling could force state jurisdictional question into the forefront.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — In the first major test of states' rights to regulate enhanced services, the District of Columbia Public Service Commission (PSC) is moving to regulate all corporations providing such services within Washington, D.C.

The PSC notified corporations in October that if they offer enhanced services — regardless of whether they own the transmission facilities over which the services are provided — they would have to apply for certification and may be subject to regulation by the PSC.

Officials at corporations who feel they should not be subject to this order had the opportunity to petition the District of Columbia PSC for exclusion.

Users immediately complained that the order was overly broad, creating confusion as to what types of firms are subject to regulation.

PSCs typically have jurisdiction over communications carriers and utilities.

However, because so many other types of firms, such as financial institutions, rely on enhanced network services, there is fear those companies may be subjected to regulation as well.

Unlimited regulation

Users and enhanced service providers said that the order, as currently written, could impact virtually every available network service, including voice mail, electronic data interchange and electronic mail.

Many complained that regulating this market is unnecessary and could backfire by slowing the introduction of new services, investment in new technologies and diminishing price competition.

The way in which the District of Columbia PSC handles the matter could have implications across the country. Federal Communications Commission officials have already expressed displeasure at the concept of 51

(continued on page 12)

WASHINGTON UPDATE

BY ANITA TAFF

AT&T continues to sell Tariff 15. Despite regulatory delays that have caused almost all Tariff 15 customers to wait for eight months to get service, AT&T last week sold its 14th Tariff 15 deal, this one to The Dun & Bradstreet Corp. AT&T told the Federal Communications Commission it will give the New York-based provider of business information services a 10% discount off Software-Defined Network Expanded Volume Plan (EVP) prices under the deal.

Additionally, the carrier will trim two years off of the regular five-year term commitment for EVP prices. In return, Dun & Bradstreet must commit to a minimum usage level of 15 million minutes per year for three years.

AT&T told the FCC that Dun & Bradstreet currently splits its traffic between AT&T and MCI Communications Corp. Unless it is allowed to undercut its tariffed prices, AT&T said Dun & Bradstreet will switch all of its traffic to MCI. AT&T claims that MCI has offered the company a deal in which it will cut its Vnet prices 3% below tariffed rates.

AT&T's controversial Tariff 15 has had a rocky history. Despite numerous investigations over the past three years, the FCC has been unable to determine whether the deals are legal. Although a number of customers now purchase service under Tariff 15, those offers are still under investigation and could be deemed illegal at any time.

AT&T's opponents claim that Tariff 15 deals, which single out a specific customer for discounts, violate provisions of the Communications Act of 1934 that bar dominant carriers from discriminating between customers. ⊡

Firm signs net deals with MCI, AT&T

continued from page 11

ety of corporate entities, from divisions to individual departments. Yorgensen said MCI worked out a system in which bills are sent directly to individual departments or groups and a summary report is sent to headquarters each month.

Additionally, MCI has monthly meetings with Baxter to discuss network outages, problem reports and the progress of network projects at field locations. MCI makes a full account of any problem that caused it to fall below the performance standards it negotiated with Baxter. MCI also has a full-time employee assigned on site at Baxter.

Uskup said the monthly meetings were required by Baxter in the early days of MCI's original contract to ensure that the transition from AT&T went smoothly. And over time, both MCI and Baxter agreed to continue the meetings.

"MCI is one of the few vendors we're not upset with, and we thought that one of the reasons was the monthly meetings," Uskup said.

"Like many companies, we have begun to work in a partnership mode with our major suppliers, and we work well with MCI," Uskup said.

Last year, Baxter went through a restructuring that resulted in the reduction of the telecommunications staff, so the firm asked MCI to take over some network tasks, Uskup said. "We reduced the telecommunications staff by more than a small amount, so it was very important for vendors to make life easier for us. MCI does," he said.

Baxter officials said their contract with MCI helped in negotiating a better deal with AT&T. Yorgensen said the firm also has a close working relationship with AT&T and thinks that the Tariff 12 contract will be beneficial.

The Tariff 12 deal has not been filed with the Federal Communications Commission yet, but Yorgensen said he isn't concerned that regulatory delays may hold up the deal. Baxter officials declined to give specifics of the Tariff 12 contract. ◘

D.C. tries to regulate enhanced services

continued from page 11

different sets of regulations for enhanced services. If the PSC or any other state regulators push the jurisdictional question too far, it could spark an ugly court or congressional battle with the FCC.

Also, the actions of the District of Columbia PSC, which is headed by Patricia Worthy, could set a precedent for other states because Worthy is also the chairwoman of the influential communications committee of the National Association of Regulatory Utility Commissioners.

This is the first effort by a local commission to regulate enhanced services since that right was explicitly returned to them last year by a court decision overturning the FCC's Third Computer Inquiry.

In its Computer III decision, the FCC went beyond its typical jurisdictional boundaries over interstate matters to include regulation of intrastate services as well. A federal appeals court last year said the FCC had acted improperly in preempting state jurisdiction.

Setting a precedent

In issuing its proposal, the PSC took the unprecedented step of attempting to regulate enhanced services provided by noncommunications firms.

The PSC has defined enhanced service providers as any firm that uses computer processing applications to act on the format, content, code or protocol of a message, as well as any firm that supports subscriber interaction with a data base.

Banking and financial institutions said in comments that they would be particularly hard hit because they rely heavily on network services in their businesses. In addition, they said they would be overburdened by another layer of regulation on top of the vigorous rules imposed on them by bank regulatory agencies.

MasterCard International, Inc. and Visa USA, Inc. filed joint comments complaining that they are not communications carriers and, therefore, are being dragged unnecessarily into the PSC's regulatory scheme.

The firms' attorney told the PSC "they are not providers of telephonic communication simply because they use such services any more than Lands' End [Inc.] is a trucking company because it uses trucking companies to deliver catalog items to its customers."

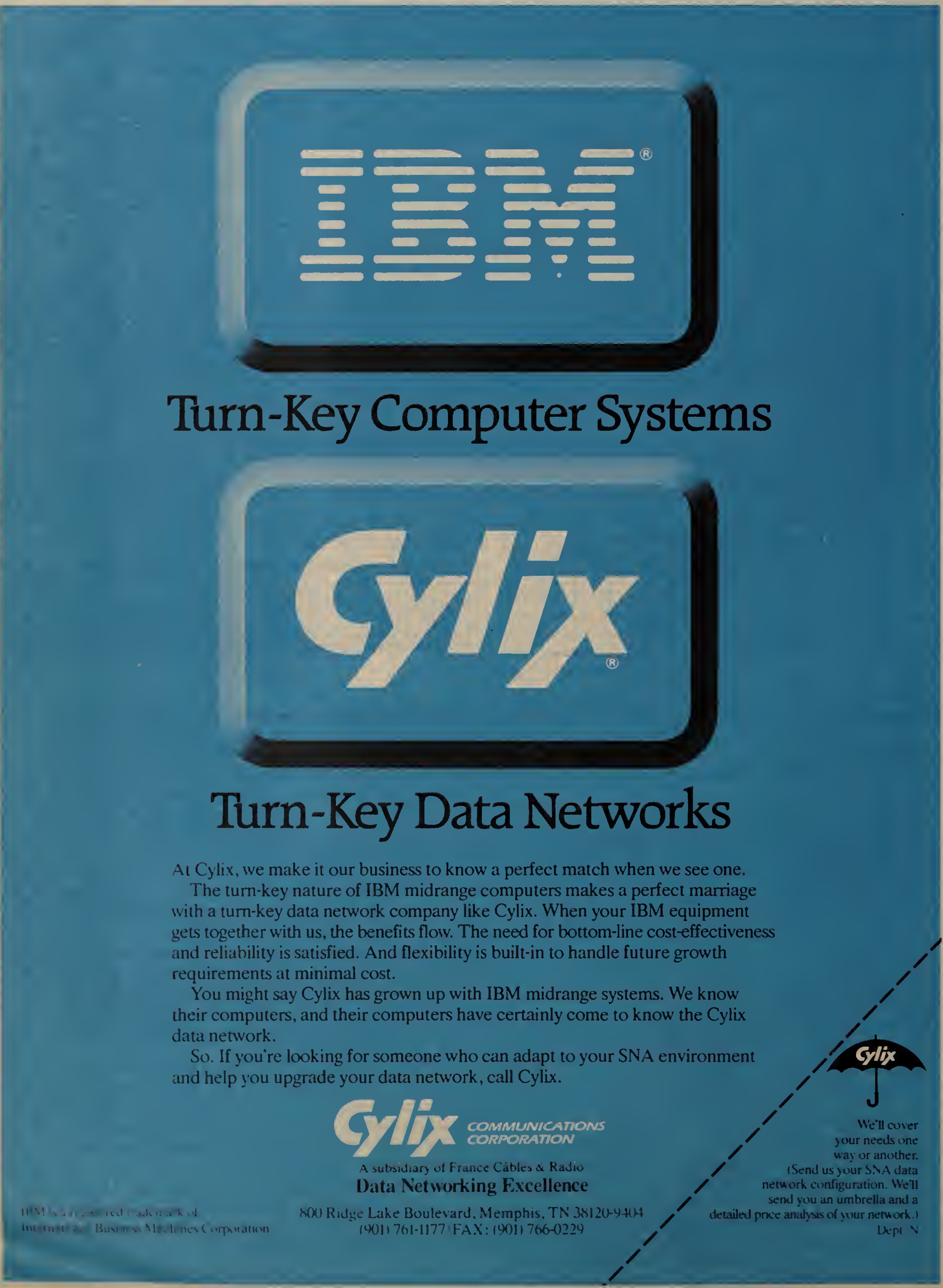
That theme was echoed by numerous other parties such as General Electric Information Services and BT Tymnet, Inc., which provide enhanced services but are not communications carriers.

Those firms, joined by US Sprint Communications Co., which provides enhanced services such as E-mail, also told the PSC that most of their services are provided on an interstate basis and, as such, are outside the jurisdiction of a local regulatory body.

Interested parties will have one more chance this week to file comments with the PSC.

After that, it is unclear whether the commission will proceed with its original proposal or possibly modify its plan to narrow the potential number of firms that would be regulated.

The PSC's efforts could also be affected by an FCC proceeding that is reexamining how far the FCC might be able to go in reclaiming some authority over enhanced services. ◘



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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

The California Education and Research Federation Network recently installed a new network node in San Jose, Calif., that will provide access to the San Diego Supercomputer Center and Internet for Silicon Valley area companies.

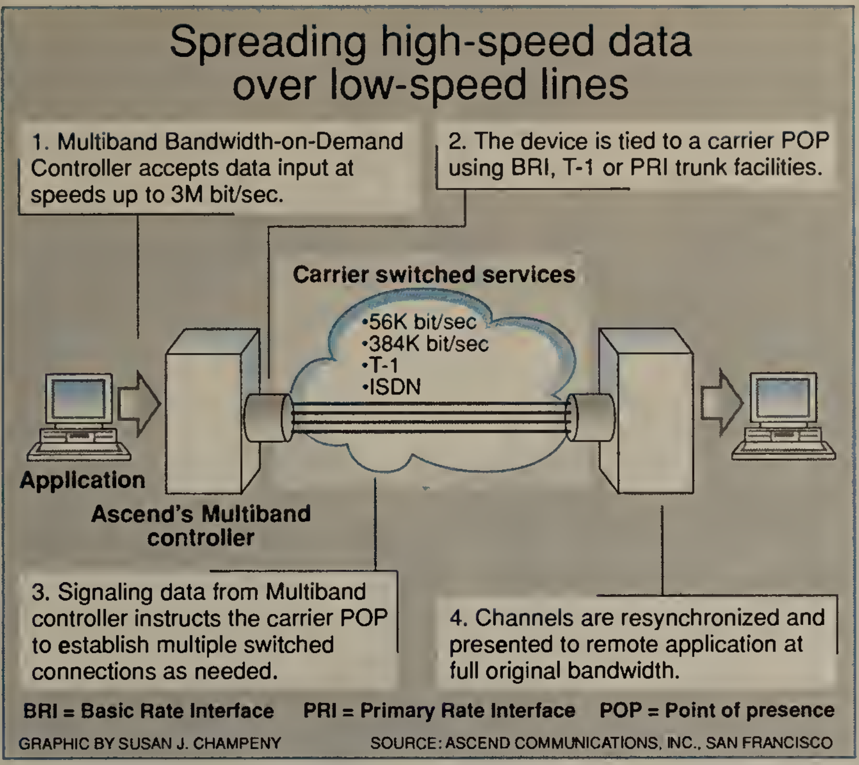
Data Packets

StrataCom, Inc. next week is expected to announce a new version of its StrataView network management software that will run on a high-end Unix workstation and is aimed at users with more than 20 IPX T-1 multiplexers.

Dubbed StrataView Plus, the enhanced software will run on a Digital Equipment Corp. DECstation 3100 high-performance Unix workstation. The company's StrataView offering runs on a personal computer. StrataView Plus adds features including high-resolution color graphics, pull-down menus and point-and-click mouse support.

StrataView Plus is scheduled to be available in April for $12,000. It will be demonstrated at next week's Communication Networks '91 conference in Washington, D.C.

BT Tymnet, Inc. last week announced that users of its X.400-based Dialcom400 messaging service can now employ the X.400 messaging standard to exchange messages with users of the IBM Information Network's X.400 mail offering and Sprint International's SprintMail. In addition, BT Tymnet said it is finalizing an agreement to interconnect with EasyLink, which AT&T recently acquired from Western Union Corp. BT Tymnet is also negotiating with GE Information Services to link Tymnet to that company's Quik-Comm System. ◻



Spreading high-speed data over low-speed lines

1. Multiband Bandwidth-on-Demand Controller accepts data input at speeds up to 3M bit/sec.

2. The device is tied to a carrier POP using BRI, T-1 or PRI trunk facilities.

3. Signaling data from Multiband controller instructs the carrier POP to establish multiple switched connections as needed.

4. Channels are resynchronized and presented to remote application at full original bandwidth.

BRI = Basic Rate Interface PRI = Primary Rate Interface POP = Point of presence

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: ASCEND COMMUNICATIONS, INC., SAN FRANCISCO

Ascend controller links users to switched services

Device establishes multiple switched connections.

By Paul Desmond
Senior Editor

SAN FRANCISCO — Ascend Communications, Inc. last week announced a line of communications controllers that give users dynamic access to high-speed switched services offered by carriers.

Ascend's Multiband Bandwidth-on-Demand Controller can cut users' line costs for applications requiring large amounts of bandwidth for short periods of time by employing switched rather than leased-line connections.

Ascend is targeting the product for use in four main applications: local-area network bridging or routing, videoconferencing, imaging, and T-1 backup and overflow.

The controller can create point-to-point virtual connections at speeds ranging from 56K to 3M bit/sec domestically, or 4M bit/sec internationally. It establishes multiple switched 56K or 64K bit/sec data links and synchronizes them at each end so the user's application is presented with a single synchronous serial bit stream.

Alternatively, Multiband can provide access to other high-speed digital services such as switched 384K bit/sec or switched T-1 lines.

All supported services are accessed via dedicated T-1 lines, Integrated Services Digital Network Basic Rate Interface (BRI) or Primary Rate Interface (PRI) lines, depending on which of the four Multiband models is used.

On the local side, the controller supports one or two V.35 interfaces or a single RS-449/RS-442 interface. An RS-232 port supports a connection to a Digital Equipment Corp. VT-100 terminal for net management or to a third-party management system.

Two models, the BRI-3 and the BRI-8, support three and eight BRI links, respectively. They can combine as many as 16 incoming BRI links into a single digital pipe of over 1M bit/sec or can be used to access carrier's switched 56K and 64K bit/sec services.

The other two models, the T/P-1 and T/P-2, support one and two T-1 or PRI connections, respectively. They are used to access the array of carrier-based switched services, including switched 56K or 64K bit/sec, switched 384K bit/sec, switched T-1 and, in the future, switched T-3 and frame relay services.

"Multiband pays for itself in six months, so there's an overwhelming economic argument for it," said Ascend President Robert Ryan. For example, a switched 384K bit/sec link is more cost-effective than a leased line if it is used less than five hours per day, he said, while a switched 56K circuit costs about the same as a direct-dial long-haul voice call of equal distance.

All the models support Multiband's Nx56 option, which lets the controller dial up as many switched 56K bit/sec links as the user's application dictates. The Nx56 option is controlled either manually, by programming the operator console in advance, or dynamically, depending on the usage requirements of the applications supported.

Joaquin Gonzalez, vice-president with the META Group, a consultancy in Westport, Conn., said

(continued on page 44)

MasterCard project aims to cut net costs

Firm plans to decentralize some operations and phase out IBM minis for less costly equipment.

By Jim Brown
Senior Editor

NEW YORK — MasterCard International, Inc. recently announced a plan to decentralize some of its credit card operations in an effort to lower network costs and improve disaster recovery procedures.

Under a sweeping plan dubbed Project Omni, the company also said it will migrate network nodes at member banks from an aging line of IBM minicomputers to a more flexible line of computers, probably Unix-based. The move could slash the cost of linking to the net for some member banks.

In addition, MasterCard said it will consider whether it should eventually outsource most of its network operations.

Under Project Omni, MasterCard will off-load daily credit card clearing and settlement tasks from leased IBM 3090 mainframes to five less expensive regional minicomputers connected via Banknet, its credit card authorization net. This will drop the cost of running its clearing and settlement application, which determines how much banks must credit to merchants' bank accounts from credit transactions and what amount it must assess to individual customer accounts.

Decentralizing these operations will also improve the company's disaster recovery scheme by eliminating the chance that a failure at the single mainframe site could bring down the entire network. By distributing the processing, data can be rerouted to other regional minicomputers in the event one minicomputer fails.

"The ultimate goal here is to reduce the expenses associated with the operational side of the business," said Philip Verdi, executive vice-president of electronic services at MasterCard.

Verdi said the first step in Project Omni is to replace old IBM Series/1 minicomputers, currently used to link member banks to its X.25 backbone, with new processors that range from microcom-

(continued on page 16)

Primary Access releases low-end data concentrator

By Jim Brown
Senior Editor

SAN DIEGO — Primary Access Corp. recently introduced a low-end version of its Network Access system that aggregates traffic from 12 local devices onto a T-1 circuit used to access carriers' switched services.

The company also released three new boards for its Network Access system, one that supports V.32-compatible modem functions and two that enable the unit to support voice traffic.

Primary Access' new Modem Bank is actually a scaled-down version of the company's Network Access device, which acts as a data concentrator, allowing hundreds of local devices to access as many as 20 T-1 lines.

The Modem Bank is a standalone device that enables users to eliminate a central-site modem rack and multiple analog facilities in favor of more T-1 circuits, which can be used to access carriers' virtual private net services.

Each Modem Bank consists of a chassis, 12 interface boards that support traditional analog modem functions over digital circuits and a T-1 interface. Users connect central-site data terminal equipment to a Modem Bank interface board, which performs all modem functions but digital-to-analog signal conversion.

Data is formatted onto 64K bit/sec DS0 channels, which are multiplexed onto a T-1 circuit along with signaling information needed to establish a switched link to a remote analog modem.

The carrier extracts the DS0 channels from the T-1 and uses the signaling information to complete the call to a remote site. The carrier will also perform the digital-to-analog conversion before delivering the data to the modem at the remote site.

Available now for $19,950, the Modem Bank comes with 12 interface boards that function as V.22bis modems at 2,400 bit/sec and a single T-1 interface. A Modem Bank with 12 interface boards that function as 9.6K bit/sec V.32 modems and a T-1 inter-

(continued on page 16)

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MasterCard aims to cut costs

continued from page 13

puters to high-powered minicomputers. The Series/1s are positioned at bank sites as Member Interface Processors (MIP) that act as packet assembler/disassemblers linking the banks to Banknet. Although MasterCard has yet to select a supplier, Verdi said, the company will likely replace the Series/1s with Unix systems.

The swap will enable MasterCard to equip member banks with processors providing the power needed to support only their traffic volumes, thus holding down maintenance costs.

"IBM announced it will no longer sell the Series/1," Verdi said. "So we will phase them out over the next five years and replace them with a scalable piece of equipment."

The majority of Series/1s used by member banks in some countries utilize only 20% of their processing power, Verdi said. In some cases, the hosts of several members in those countries are linked to a shared Series/1. But even then, much of the processing power goes unused.

Swapping out the Series/1s for new hardware will neither require any changes to backbone net lines nor require any communications software changes because each new MIP will run the same X.25 package.

Verdi also said the backbone network configuration will not change once the regional minicomputers, also likely to be Unix-based, are installed to support clearing and settlement applications. That application has been running on MasterCard's IBM 3090 mainframes for 14 years.

Distributing the task across five systems drastically cuts the risk that a system failure would halt all clearing and settlement tasks, Verdi said. Each of the systems, called Remote Access Processors (RAP), will clear and settle transactions forwarded to it by the MIPs in its region.

If one fails, Banknet will route transactions to the remaining four. Once the downed RAP is brought back on-line, the other RAPs will update it.

Verdi said MasterCard will continue looking at ways to reduce transaction processing costs, including the possibility of outsourcing network operations.

"Although we are in the networking business, there are specialists out there that can do a better job," Verdi said. "And if you look at it, who is better suited to operate a net than a carrier?"

However, Verdi said MasterCard is only starting to study outsourcing, adding that it could take at least four months before it decides whether the option merits any action. Even though it is early in the study phase, Verdi said MasterCard wants potential outsourcing vendors to hire its existing operations personnel.

"That is one of the things I'm starting out with as a requirement," Verdi said. "I may have to back off of that a little, but I would be uncomfortable if we didn't start going in that direction." ◘

Firm releases concentrator

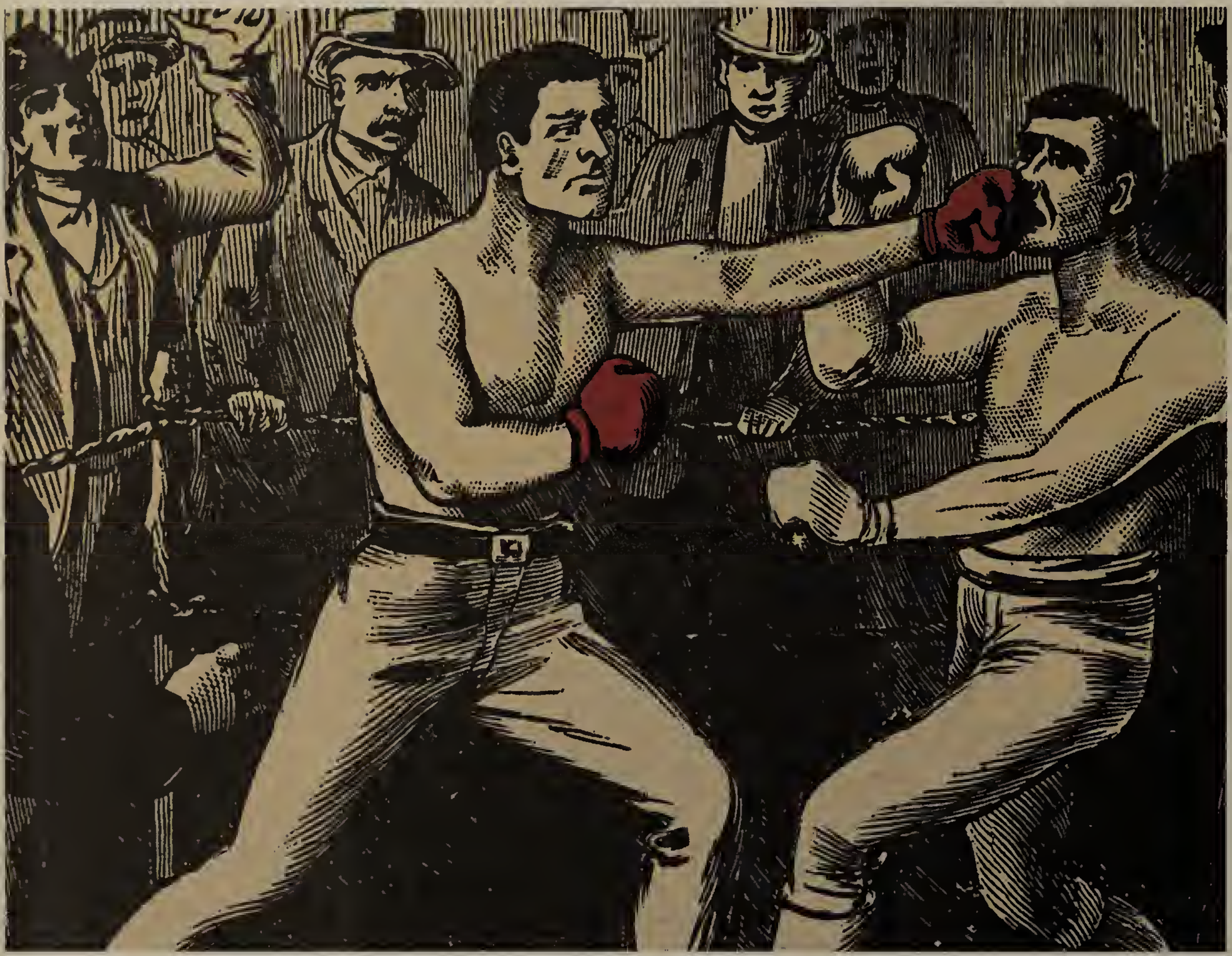
continued from page 13

face costs $24,950.

The new V.32 modem board can be purchased as an add-on that resides in one of the 21 slots of a Network Access system chassis, thus enabling it to communicate with remote V.32 modems. Each board supports two modems and costs $1,125. Users download V.32 software to the board via the Network Access system operations console. That software costs $1,000.

Primary Access' new Foreign Exchange Station (FXS) and E&M boards also reside in a Network Access system chassis.

The eight-port FXS board with required software costs $1,900 and enables users to connect analog key telephone systems, facsimile machines or individual telephone sets to a Network Access system. The eight-port E&M board with required software costs $1,700 and enables the Network Access system to support tie lines between private branch exchanges. Both boards will be available in March. ◘



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Worth Noting

> "I love fiber. Backbone fiber is king. But fiber to the desktop is another example of a technology looking for a market."

Bill Redman
Vice-president of
networking services
Gartner Group, Inc.
Stamford, Conn.

Netnotes

Cisco Systems, Inc. last veek brought out what it laims is the first product to erform concurrent inter-etwork routing, bridging and rotocol translation.

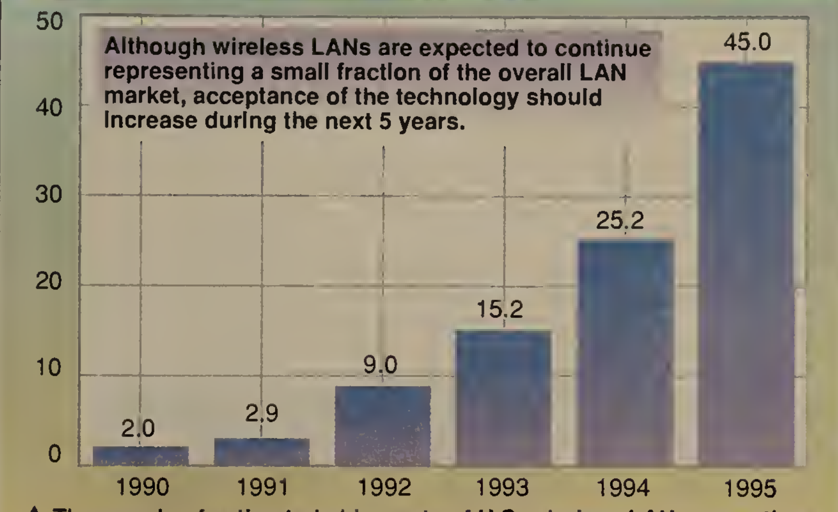
To achieve this goal, cisco Systems added a gateway opion to its existing Integrated Gateway Server (IGS) bridge/outer.

According to the company, he software provides intercommunications between etworked devices running Transmission Control Protocol/Internet Protocol, X.25 nd Digital Equipment Corp.'s ocal Area Transport protools. The IGS with protocol ranslation software, includng bridging, X.25 and frameelay support, will begin shiping in March for $6,595.

Shiva Corp. is set to exand its current line of EtherPort Apple Computer, Inc. lacintosh-to-Ethernet interace cards to include 10BaseT upport.

The new cards — EtherPort SET, EtherPort SE/30T nd EtherPort IIT — will conect Macintosh SE, SE/30 and lacintosh II computers to 0BaseT twisted-pair Etheret. They will be available ext month.

Pricing for the new cards is n line with an overall price reluction on Shiva products that ook effect Jan. 1. According to the company, the entire line of Shiva EtherPort cards will now be available for $499. Shiva also reduced pricing on its NetModem V2400 and NetModem V.32, which are now priced at $499 and $1,699, respectively.



Wireless LANs to fill a niche

▲ Thousands of estimated shipments of U.S. wireless LAN connections

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Users praise feature-laden MS Mail Version 3 software

Upgrade has group lists, other enhancements.

By Caryn Gillooly
Senior Editor

REDMOND, Wash. — Microsoft Corp. last week introduced Version 3.0 of Microsoft (MS) Mail for Apple Computer, Inc.'s AppleTalk networks, an upgrade hailed by users as having much needed features.

The new version includes capabilities such as multiple file attachments, personal address books and group lists, and a host of management features to help both managers and users keep better track of mail messages.

The principle behind Version 2.0 was to concentrate on performance rather than functionality, according to Kathleen Schoenfelder, product manager of Macintosh work group applications for Microsoft, based here.

> Schoenfelder said Microsoft took to heart users' needs when designing the upgrade.

▲▲▲

"The original MS Mail design goal was architectural," she said. "Version 2.0 was very high performance. It out-performed our closest competitor by about 5-to-1." The product was criticized, however, for lacking some necessary features.

Version 3.0, Schoenfelder said, is user-focused. "This design focus was totally different. Now MS Mail has a rich and flexible environment," she said.

According to Schoenfelder, Microsoft took to heart users' needs when designing the upgrade. The most requested feature, she said, was the ability to let users attach more than one file to a message, a feature that was missing from the previous version. With Version 3.0, the number of file attachments on each message is unlimited, although the network manager can choose to set a memory limit on messages to avoid affecting network performance.

Other features

Users were also looking for the ability to have personal address and group lists. Version 2.0 offered users only a flat file global directory, which, according to Schoenfelder, might have been overwhelming for a user looking for one name out of 12,000, for example. With Version 3.0, the user can create a personal directory or any type of group list, which is automatically updated if a change is made in the global directory.

Other features to help organize and manage messages include: custom message folders, which let customers use their graphical user interface to drag and drop messages into desired folders; an appended save feature, which lets the user archive multiple messages into one text file and continue to add messages; a summary window, which can display messages sorted by time, sender or subject; and a dial-up utility, which lets users access all messages remotely using any terminal-emulation program.

On the performance side, Ver-

(continued on page 20)

FDDI interface has SMT, SNMP support

VMEbus adapter from Rockwell CMC combines capabilities of network management standards.

By Eric Smalley
Senior Editor

DALLAS — Rockwell International Corp. subsidiary Rockwell CMC has developed an FDDI adapter for VMEbus systems that includes integrated Station Management (SMT) and Simple Network Management Protocol (SNMP) software.

The software in the CMC-1150 series adapter implements an SNMP agent, provided by Epilogue Technology, Inc. under an OEM agreement, that allows SNMP management stations to control devices employing the Rockwell CMC adapter.

For example, a network manager at an SNMP net management station could produce reports from or set thresholds for statistics generated by SMT software on a Rockwell CMC Fiber Distributed Data Interface in an FDDI-to-Ethernet router.

Rockwell CMC's software conforms to the current draft of the FDDI Management Information Base (MIB) Working Group of the Internet Engineering Task Force's proposed standard for the FDDI MIB, according to Russell Sharer, Rockwell CMC's director of marketing.

The FDDI MIB replicates as closely as possible the SMT MIB, though some SMT MIB variables have to be translated, according to Bruce McClure, founder of the SMT Forum and president of Synernetics, Inc., a vendor of FDDI concentrators.

The SMT portion of the FDDI standard is a link-layer protocol that maintains the integrity of the FDDI ring. SMT, the only part of the standard yet to be adopted, should be ratified this spring.

The Rockwell CMC software tracks some but not all of the SMT variables, Sharer noted.

Because FDDI networks are likely to be employed as backbone networks connecting Ethernet LANs, the FDDI MIB will be required to manage devices that connect to both FDDI and Ethernet, McClure said.

The CMC-1150 adapter, available in single- and dual-attached

(continued on page 20)

RAD Data fiber-to-desktop product line makes debut

By Caryn Gillooly
Senior Editor

WASHINGTON, D.C. — RAD Data Communications is scheduled to introduce OmniFiber, a product designed to help IBM shops bring fiber to the desktop, at the Communication Network '90 conference here next week.

OmniFiber enables users to connect their terminals or personal computers to mainframes, minicomputers or local-area networks over single-mode, multimode or plastic optical fiber.

According to RAD Data, the product consists of two components: a 16-slot chassis that accepts a variety of interface cards and remote units at each end-user device.

Customers use traditional copper cable links to tie their computers to product-specific interfaces in the OmniFiber. The interfaces then convert the electrical signals into optical impulses for transmission via fiber to the end-user interface, which translates the information back to an electrical signal.

An IBM Application System/400, for example, would be linked via copper to the central unit via an OmniFiber AS/400 interface that converts the signal to an optical output. The remote unit terminating the fiber cable run to the user's desk would then be outfitted with a corresponding interface for an AS/400 terminal.

Besides AS/400 connections, RAD Data offers interfaces that support four-channel V.24 or V.11 multiplexed links, two-channel 3270 links, 4M/16M bit/sec token-ring network connections and Ethernet links.

According to RAD Data, no other company offers this type of product for fiber to the desk. Hub products offered by companies such as Fibronics International, Inc. support a fiber-optic backbone with copper to the desk.

According to Ami Amir, president of RAD Data, OmniFiber was designed to meet the needs of the

(continued on page 18)

Western Digital E-net card works with coaxial, thin-wire, 10BaseT

By Eric Smalley
Senior Editor

IRVINE, Calif. — Western Digital Corp. is set to unveil this week a line of Ethernet adapter cards for personal computers, including a model that can be configured for use with standard coaxial and thin-wire Ethernet cabling, as well as with 10BaseT twisted-pair wire.

The new line is highlighted by the EtherCard Plus Elite16 Combo, a 16-bit board that comes with standard coaxial, thin-wire and unshielded twisted-pair connectors.

Users configure the adapter for the cable type by moving a jumper pin on the board.

The advantage offered by the board, according to Kristine Stewart, Western Digital's manager of reseller distribution, is that users can install it without later having to swap it out or add an external transceiver when changing cabling schemes.

The EtherCard Plus Elite line comes with personal computer software, called EZ Setup, for users that prefer to configure board interfaces after they have been installed.

> The line is highlighted by the EtherCard Plus Elite16 Combo.
>
> ▲▲▲

The boards also work with Western Digital's SuperDisk.

Other models in the line include the 8-bit EtherCard Plus Elite, the 16-bit EtherCard Plus Elite16 and the 16-bit EtherCard Plus Elite16T. The Elite16 replaces Western Digital's previous 16-bit coaxial Ethernet adapter, the EtherCard Plus16. The Elite16T has a 10BaseT connector.

All four Elite adapters are for IBM Personal Computer ATs and XTs. The boards have an on-board read-only memory socket for use with diskless microcomputers.

The Elite series of Ethernet adapters is available now. The EtherCard Plus Elite is priced at $249, the Elite16 costs $399, the Elite16 Combo is priced at $399, and the Elite16T sells for $349.

For more information, write to Western Digital at P.O. Box 19665, Irvine, Calif. 92713, or call (714) 932-5000. ◘

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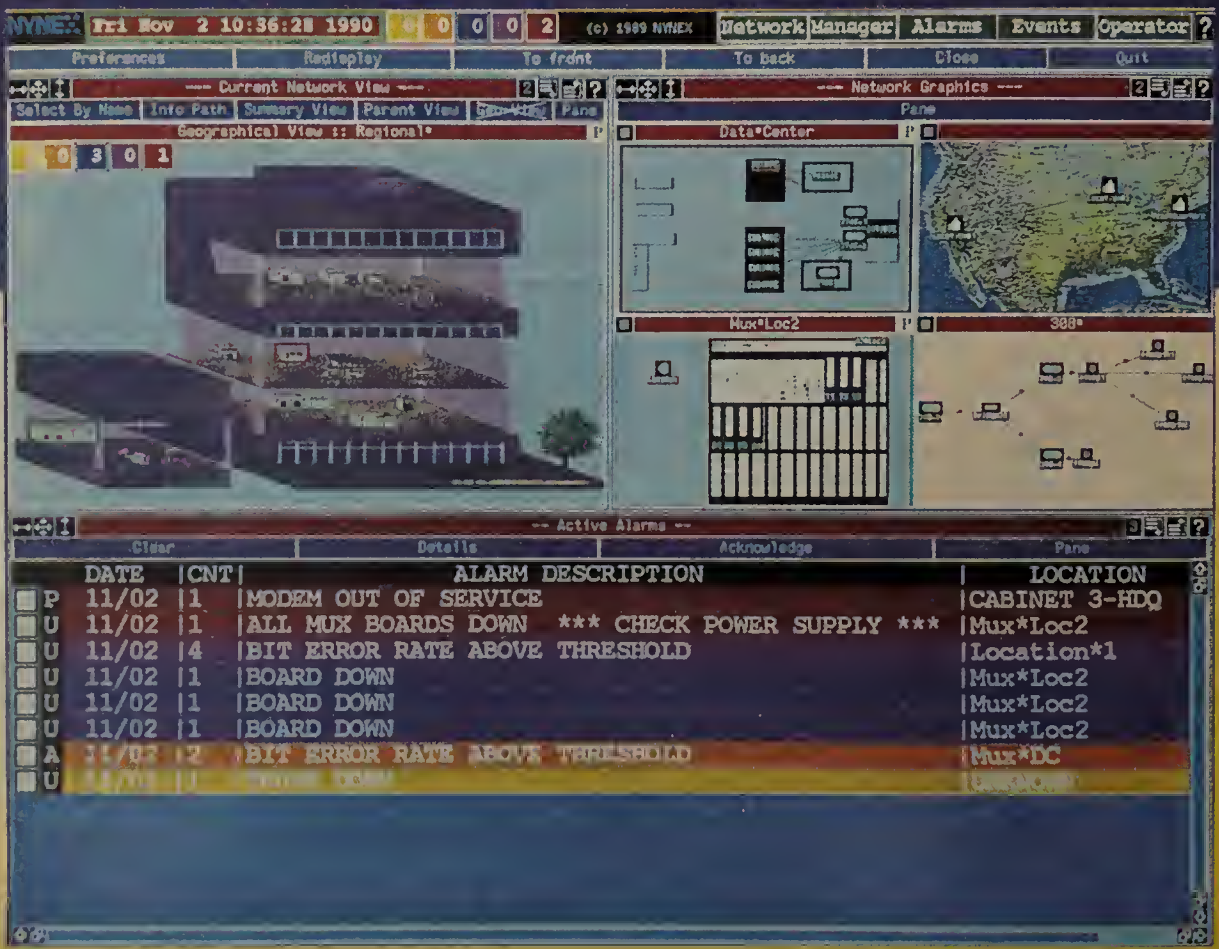

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   DATE  |CNT|              ALARM DESCRIPTION                  |  LOCATION
 P 11/02 |1  |MODEM OUT OF SERVICE                             |CABINET 3-HDQ
 U 11/02 |1  |ALL MUX BOARDS DOWN  *** CHECK POWER SUPPLY ***  |Mux*Loc2
 U 11/02 |4  |BIT ERROR RATE ABOVE THRESHOLD                   |Location*1
 U 11/02 |1  |BOARD DOWN                                       |Mux*Loc2
 U 11/02 |1  |BOARD DOWN                                       |Mux*Loc2
 U 11/02 |1  |BOARD DOWN                                       |Mux*Loc2
 A 11/02 |2  |BIT ERROR RATE ABOVE THRESHOLD                   |Mux*DC
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Fiber-to-desktop product line debuts

continued from page 17

company's current customers. One European customer, he said, wanted to run single-mode fiber to the desktop now with hopes of running higher speed links to the desktop in the future.

Although the product has not been released in the U.S., it has been on the market in Europe for about a year under an OEM agreement. In fact, according to Amir, OmniFiber has been standardized in one large European country as the fiber solution for the government. He declined to name the country.

One possible drawback of OmniFiber is that it does not support the Fiber Distributed Data Interface standard for 100M bit/sec fiber-optic transmission.

According to Amir, however, RAD Data is in the process of developing an FDDI solution. "We need to see first if [FDDI] pricing will go down sufficiently for our users to be able to afford it," he said.

Some analysts questioned whether there is much demand for products that bring fiber to the desk.

"Fiber optics to the desktop is absolutely overkill," said Bill Redman, vice-president of networking services at Gartner Group, Inc., a research firm in Stamford, Conn. "It's only for niche markets."

Analysts agree that today's trend is to make the most of available bandwidth rather than pull new cabling. "Look at the Copper Distributed Data Interface that's going to specify 100M bits over copper," Redman said. "We're going to drive copper to rates [once] thought impossible."

"It used to be one of the biggest FUD [fear, uncertainty and doubt] factors was imaging," he said. "But look at what companies have done with data compression."

Rick Villars, an analyst at International Data Corp. in Framingham, Mass., pointed out that even if large IBM users were to look toward a fiber-to-the-desk solution, they would most likely turn to IBM for the necessary components.

"We don't see a lot of interest in fiber in IBM shops in general," he said. Villars added that there might be demand in more technical environments or for image applications, but with the recent unveiling of IBM's Enterprise System Connection (ESCON) architecture for high-speed networking, third parties will have trouble competing with IBM.

According to RAD Data, the basic 16-slot card chassis costs $1,200 and rack unit cards cost between $640 and $1,200 each. Remote unit cards cost between $60 and $640. ◘

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WHERE DO YOU TURN?

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Users praise feature-laden MS Mail 3

continued from page 17

sion 3.0 has a client caching capability that dynamically saves information on the client machine to reduce the number of server requests and reduce network traffic, Schoenfelder said.

The new version can also perform multihop routing, enabling the network to define one server as a bridge to another.

"This gives the user tremendous flexibility in configuring the network," Schoenfelder said.

Other performance enhancements include optional directory propagation, which lets administrators limit access to directories across different sites, and features such as automatic backup, deletion of old messages, and global and local server statistics to help administrators better manage the network.

"We've found significant improvement over the previous product," said Gene Ledbetter, a retiree of Procter & Gamble Co. who is still working with the company on beta-testing MS Mail Version 3.0.

According to Ledbetter, speed and performance were the primary improvements over Version 2.0. "We have a lot of users who dial in from the road," he said. "The old product was fairly slow; you needed a high-speed modem to keep things moving. Now we can use a 2,400 [bit/sec] modem."

Ledbetter also said the upgrade from 2.0 to 3.0 will be much easier than the previous upgrade.

"One of the great things is this product's compatibility with the current version," he said, so all users will not have to upgrade at the same time, as was the case with the previous version.

Diane Achman, staff manager of user support services for McDonnell Douglas Corp. in Huntington Beach, Calif., also a beta-test site for the product, agreed that compatibility with the previous system is a significant plus.

"I like how they incorporated all the enhancements and left the user interface clean," she said. "We could give this to the end user without additional documentation."

Achman said she found the network administration features most useful, particularly the automatic backup. "Before, we had to take everybody off-line to do backup," she said. "Now we can set the system to back up automatically during the night."

According to Microsoft, MS Mail Version 3.0 will be available in the first quarter. Microsoft Mail Server will cost $395, and the client Macintosh software will cost $395 for a five-user package and $1,349 for a 20-user package.

Personal computer workstation versions will be available in five-user packages for $395. ⧉

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COMMUNICATION NETWORKS
CONFERENCE & EXPOSITION

FDDI interface has SMT, SNMP support

continued from page 17

models, is a 6U-size VMEbus board powered by an Advanced Micro Devices, Inc. 29000 Reduced Instruction Set Computer processor. The CMC-1150 is a second-generation product, adding 2M bytes of video random-access memory, 512K bytes of Content Addressable Memory and Rockwell CMC's Link Layer Controller.

The added RAM is meant to support Rockwell CMC's Transmission Control Protocol/Internet Protocol stack, which the company plans to add to the adapter later this year, Sharer said. Placing the protocol stack in the adapter off-loads protocol processing tasks from the host.

The Content Addressable Memory can be used for address recognition, making the adapter appropriate for use in bridges and routers, Sharer said.

> The first version of the CMC-1150 includes a device driver for Sun Microsystems, Inc.'s SunOS version of Unix.

▲▲▲

Rockwell CMC's Link Layer Controller replaces some chips from the AMD chipset and increases the data path from 16 to 32 bits. The increased data path size allows the adapter to maintain a high level of throughput when the network load is heavy, Sharer said.

The first version of the CMC-1150 includes a device driver for Sun Microsystems, Inc.'s SunOS version of the Unix operating system. A subsequent version will also include a driver for AT&T's System V Unix, according to company officials.

The CMC-1156 dual-ring attachment adapter costs $11,955, while the CMC-1155 single-ring attachment adapter costs $11,245. The software implementing the SMT MIB for SNMP, called Release 2.0 Link Layer Driver for Unix, costs $2,495 when purchased separately from the adapters. It is scheduled for availability in April.

Separately, Rockwell CMC announced that it has upgraded its twisted-pair Ethernet adapter cards to comply with the 10-BaseT Ethernet standard.

Rockwell CMC can be reached at 125 Cremona Drive, Santa Barbara, Calif. 93117, or call (805) 968-4262. ⧉

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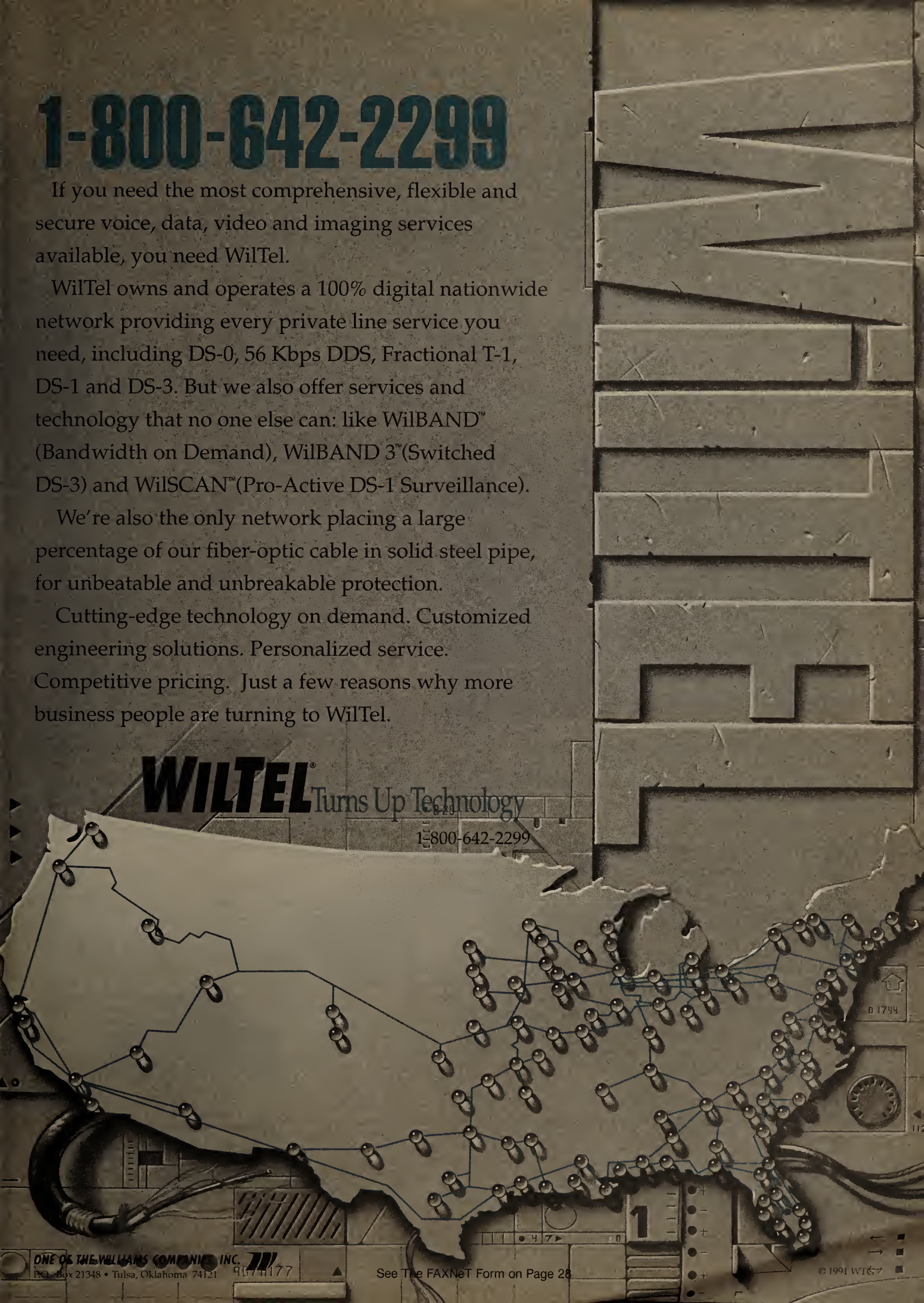

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Worth Noting

"I am surprised at how many people are fearful of going to client/server computing. They're reluctant to embrace client/server computing because it would force them to work with vendors and software they're not familiar with."

Charlie Snell
Director of computing and communications services
Harris Corp.
Melbourne, Fla.

Dialogue

Donna Kwak, senior vice-president of administrative services with Chase Bank of Arizona, last month was elected as the 1991 corporate president and 1992 chairwoman of the **Tele-Communications Association, Inc. (TCA).**

An Arizona Chapter member since 1982, she was most recently vice-president of member services for TCA. She was also Corporate Membership Committee chairwoman in 1985, and she served a two-year term as corporate budget chairwoman and chief financial officer. She has also been a corporate director representing her chapter.

During her two-year term, Kwak plans to focus on several aspects of the TCA and its role in the professional development of its members.

In addition to creating more educational programs, Kwak said she hopes to develop chapter strength. She sees the chapters as the element that distinguishes TCA from other associations and wants to increase member involvement on the chapter level.

TCA is a nonprofit organization with more than 1,000 member companies that exists for the advancement of telecommunications professional and technical knowledge.

Beta-testing: The benefits outweigh the drawbacks

Can provide strategic advantage, product input.

By Maureen Molloy
Staff Writer

Though significant risks exist, users say the strategic gains to be made from beta-testing prereleased products outweigh potential drawbacks.

The greatest benefit of beta-testing network products is getting a preview of new technologies and the opportunity to influence product development.

"When you beta-test, the input you provide on the product is more readily heeded by vendors," said James McCabe, project leader for the network development group at the National Aeronautics and Space Administration's Ames Research Center.

Mark Payne, worldwide electronic data interchange deployment manager at Texas Instruments, Inc., agreed. He said the greatest benefit users obtain by teaming up with vendors is the opportunity to influence the design process. Hence, the final product will more likely suit a user's needs because it is designed with those needs in mind.

He also pointed to the strategic advantages in acquiring a product or service in advance.

"The reason you may want a product in advance is because you'll achieve some strategic benefit from having it earlier," he said. "But it's crucial that there be a clear benefit before you agree to accept a product in the beta stage.

"We're not good samaritans who'll test a vendor's software just for the heck of it," he added. "It's when we think we need a product or service in advance of its official release that we'll bring it in earlier and get to work on it."

Oregon State University's College of Business uses beta tests as a way to acquire the latest high-tech gear free or at a discount.

Greg Scott, the school's director of computing services, regularly visits a group of eight target vendors in key technology markets — including Hewlett-Packard Co., Novell, Inc. and Microsoft Corp. — to try to get them to offer deals on products in ex-

(continued on page 26)

BOOK REVIEW

BY ERIC SCHMALL

Book on net management short on LAN advice

LANs to WANs: Network Management in the 1990s, Robert Davidson and Nathan Muller (Boston: Artech House, 1990), $79.

It's true that you can't judge a book by its cover. This book also proves that you can't judge a book by its title either.

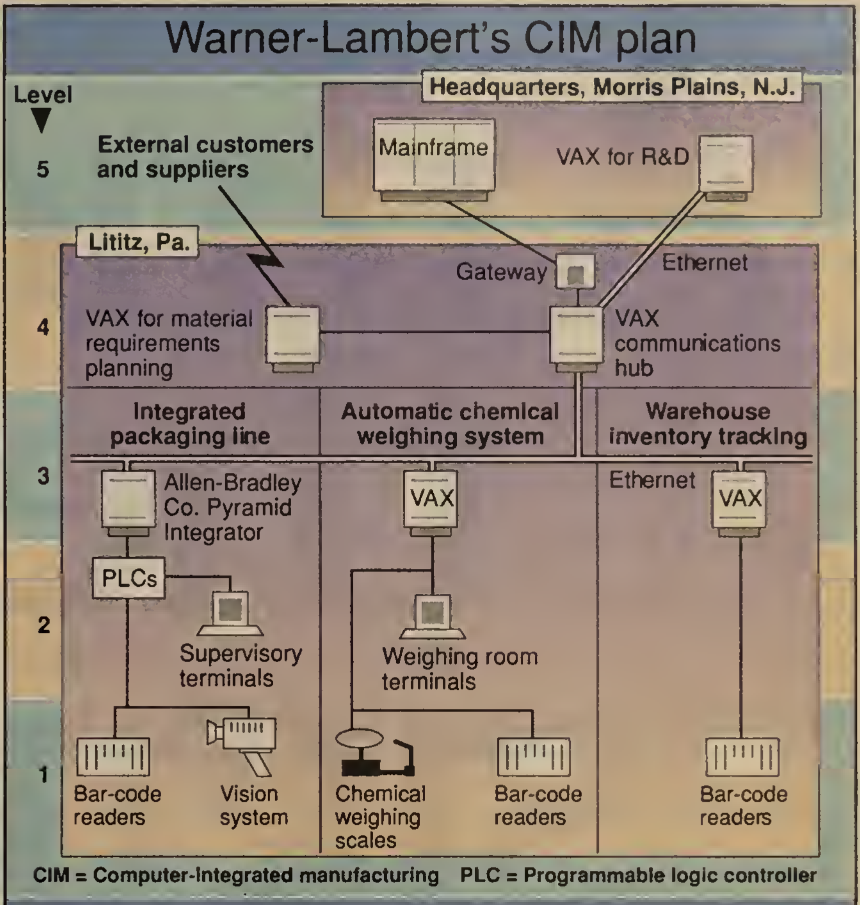
The title suggests that this text would provide a comprehensive view of network transmission issues ranging from local- to wide-area networks. If so, the book only half delivers on its title message. LANs account for about 70 pages of text, a decidedly slim portion of the discussions in a book that goes on for more than 500 pages. The overwhelming majority of the focus is on WAN considerations.

The subtitle, "Network Management in the 1990s" would lead one to conclude that the book will focus on the topic of integration of network management systems. Wrong again. That topic receives a little more than 30 pages of coverage.

Fortunately, the authors do much better meeting the goals they outline in the book's introduction. Their goal, it says, is to offer a comprehensive survey of the current and future "network landscape" and to provide a technical reference for communications managers, planners and consultants.

The authors have done a reasonable job describing concepts and technologies as simply as possible. Still, that effort occasionally suffers, as when they examine the Integrated Services Digital Network functionality of Northern Telecom, Inc.'s SL-1 switch: "The [Primary Rate Interface] card is mated with another card, the D Channel Handler Interface QPC757, which actu-

(continued on page 26)


Warner-Lambert's CIM plan
Level
5
4
3
2
1
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Mainframe
VAX for R&D
External customers and suppliers
Lititz, Pa.
Gateway
Ethernet
VAX for material requirements planning
VAX communications hub
Integrated packaging line
Automatic chemical weighing system
Warehouse inventory tracking
Allen-Bradley Co. Pyramid Integrator
VAX
Ethernet
VAX
PLCs
Supervisory terminals
Weighing room terminals
Bar-code readers
Vision system
Chemical weighing scales
Bar-code readers
Bar-code readers
CIM = Computer-integrated manufacturing
PLC = Programmable logic controller

Warner-Lambert has developed a 5-level CIM architecture to support a series of integrated manufacturing systems that will improve quality, reduce inventories and increase productivity at its plant in Lititz.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: WARNER-LAMBERT CO., LITITZ

CIM success requires winning over execs

Also requires detailed systems architecture to help contain costs, speed net implementation.

By Wayne Eckerson
Senior Editor

LITITZ, Pa. — While most executives of manufacturing companies recognize the strategic importance of computer-integrated manufacturing (CIM), many still balk when it comes to funding expensive CIM technologies.

The key to gaining and keeping top management support is to find a "CIM champion" in the upper ranks of the company who has credibility with senior executives and can pitch the benefits of CIM, said Kenneth Taylor, director of engineering at Warner-Lambert Co. here.

It is also critical to develop a systems architecture that standardizes the purchase of software, hardware and communications equipment throughout the plant, Taylor said. A CIM architecture reduces the cost of equipment purchases and shortens the time needed to implement applications, he said.

Taylor has put these lessons to use in spearheading the implementation of a five-year CIM plan at a Warner-Lambert manufacturing plant here that he said will improve quality, reduce inventories and boost productivity.

Now in the third year of the plan, the plant, which manufactures consumer health products, has implemented two integrated systems: a material requirements planning (MRP) system and a chemical weighing system.

Seven more integrated systems will be implemented by the end of this year, including a chemical analysis system that determines the active ingredients in finished products, as well as a time and attendance system that tracks employee work hours and determines labor costs.

The CIM plan is based on a five-level architecture that defines the flow of information from factory-floor devices to a plantwide host processor, as well as to external sources such as Warner-Lambert's headquarters in Morris Plains, N.J., and various customers and suppliers (see graphic, this page).

An Ethernet network running Digital Equipment Corp.'s DECnet provides connectivity among processors throughout the plant. The network currently supports more than 50 personal computers used by engineers, planners and line supervisors, as well as a cluster of eight DEC VAX processors that support the plant's integrated manufacturing systems, said Allen Kennedy, the firm's information systems manager who helped develop the architecture.

(continued on page 26)

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Beta-testing: Benefits outweigh drawbacks

continued from page 23

change for the right to beta-test equipment at the school.

Since 1987, the school has beta-tested about a dozen hardware, software and network products.

"Given that the mission of the university is to do research, I view beta-testing as applied research," Scott said.

All agreed that users must have a well-defined strategy before agreeing to perform beta tests for a supplier. Most said they beta-test only those products or services from vendors that are perceived as pursuing leading-edge technology.

"I'm only interested in developing long-term relationships with the industry-leading vendors," Scott said.

Payne said his strategy is to identify the leading technologies and seek out the vendors he views as leaders in various technological areas. "There's an art to doing beta-testing, and part of it is to develop strategic alliances with key vendors."

Most users said it's critical to look for suppliers having more than one user testing the product. "Naturally, you don't want the vendor to fan out the product to the whole world, but it's critical that you not be the only beta site," Payne said. "You need to communicate with other beta sites because they might find errors or problems that you didn't."

One of the main drawbacks to being a beta site, users said, is the time and resources needed to complete a beta test.

"Doing beta-testing uses up a tremendous amount of time and manpower and demands special facilities, so some users can't be beta sites simply because they lack the resources," NASA's McCabe said.

An even greater drawback is that beta-testing can sometimes set network plans back and wreak havoc on a user's network.

"Beta products have the potential to be destabilizing, so you need to protect the product in a testing lab until you're certain it's reasonably stable," Scott said. "You need to understand that you're creating a risky setup if you inject a prereleased product into your production system." ◪

CIM success requires winning over execs

continued from page 23

To gain top management support for CIM, Taylor first began an aggressive campaign to educate plant managers about the strategic importance of CIM and its benefits. He then gained the backing of top-level engineers at the firm's headquarters who helped persuade the company's top brass to embrace CIM.

"It takes a lot of talking, and you have to have a good track record in the company," said Taylor, who was and still is the firm's CIM champion. "Expect to work at least a year before you get top management support to initiate a CIM project."

The difficulty in obtaining management support for CIM projects is that many of CIM's benefits are intangible and cannot easily be quantified, Taylor said.

The soft benefits of CIM include streamlined organizational processes and improved coordination among various groups within a company, higher quality products and improved customer service through the use of electronic data interchange and just-in-time delivery, he said.

"Although there will be hard savings generated by the reduction of waste, improved productivity and lower inventories, in most cases, these will not provide the robust return that most companies consider desirable for major projects," Taylor said.

"CIM projects require a more visionary and sophisticated analysis that considers both hard and soft savings," Taylor said.

To reduce costs associated with implementing CIM systems and ensure connectivity among all processors, the Lititz plant has standardized on Allen-Bradley Co. programmable logic controllers (PLC) as well as Allen-Bradley's Pyramid Integrator, an intelligent device that links PLCs to a DECnet network.

The plant's Ethernet network allows any of Lititz's engineers, line supervisors or other workstation users to access factory-floor data stored in a VAX or Pyramid Integrator on the Ethernet. Workstation users can also access applications on Warner-Lambert's IBM 3090 mainframe in Morris Plains via a network gateway.

The network will enable individuals to use their workstations to access data about any manufacturing line at the plant. This will help engineers detect manufacturing problems earlier and enable planners and other managers to determine quality parameters or other items that could not be obtained previously. ◪

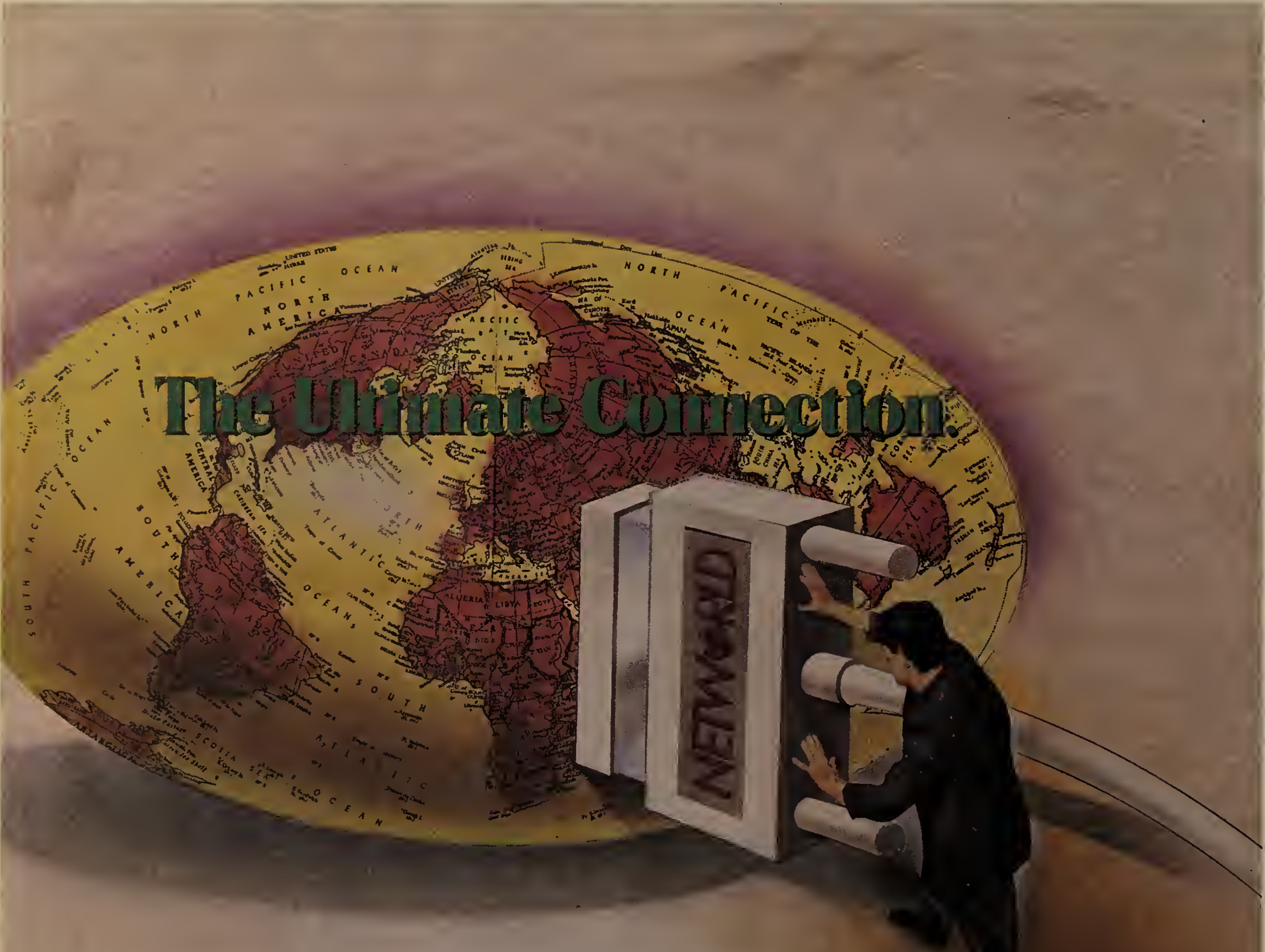
Book on net mgmt. short on LAN advice

continued from page 23

ally processes the D channel data on behalf of the PRI card." When the authors descend to this level of detail, readers must keep reminding themselves that much of this book is devoted to reference matters.

Credit has to be given to the comprehensiveness of the WAN technology sections. There are very impressive dissertations on the workings of digital networks, multiplexers, ISDN, fast packet switching and Synchronous Optical Network. Few books on networking have attempted to broach these evolving technologies to the extent that the authors have here.

This book can be ordered directly from Artech House by calling (800) 225-9977. ◪



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INTERNATIONAL NETWORKS

USER STRATEGIES, INTERNATIONAL SERVICES & REGULATION

World News

Belgium's national carrier, **Regie des Telegraphes et des Telephones (RTT)**, last week said it won a contract to supply four 2M bit/sec links to the Society for Worldwide Interbank Financial Telecommunication (SWIFT), an international electronic funds transfer service provider in La Hulpe, Belgium.

One of the 2M bit/sec links will carry traffic between SWIFT headquarters and SWIFT sites in the U.S., another will carry traffic from the headquarters to SWIFT sites in The Netherlands, a third will connect SWIFT's La Hulpe hub to a net management system operated by RTT called the System for Reliable Access to the RTT net, while the fourth will be used as spare capacity.

Columbia Communications Corp., a private satellite firm that is planning to use capacity from two National Aeronautics and Space Administration satellites to provide international satellite service to the U.S., Europe and the Pacific Rim, last week said the the Federal Communications Commission is forwarding its application to provide service to the International Telecommunications Satellite Organization for approval. INTELSAT approval is needed to assure the Columbia satellite service will not technically interfere with INTELSAT. New revisions to INTELSAT's operating procedures, however, will make Columbia the first private, international, satellite operator that will not have to prove that its service will not harm INTELSAT economically.

MCI finds Japanese are big users of Commax service

No U.S. users sign up for MCI's facilities mgmt.

By Barton Crockett
Senior Editor

PISCATAWAY, N.J. — If MCI Communications Corp.'s Commax service is any indication, Japanese network users are much fonder of international facilities management services than are their U.S. counterparts.

MCI is drawing this conclusion because nearly a year after introducing Commax — a service in which MCI, the Japanese carrier Kokusai Denshin Denwa, Ltd. (KDD) and British Telecommunications PLC build and operate international nets for users — the service has yet to attract a single U.S. subscriber.

By contrast, every Commax user to date, except for two European multinationals, is a Japanese firm with U.S. operations. Although William Donner, MCI's general manager of business systems marketing, expects a U.S. firm to sign up for Commax soon, he said that for now at least, it appears that Japanese users have a greater yen for facilities management services than do U.S. companies.

"What I'd have to say is that this kind of outsourcing arrangement is much more popular with the Japanese than with the Americans, although I think this is changing because the Americans are starting to use outsourcing more," Donner said.

Masaru Niimura, telecommunications manager with Nichi Men Corp., a Tokyo-based import and export firm and early Commax user, agreed.

"It is a very common practice for Japanese companies to let carriers operate their networks," he said. "In this way, I believe the Japanese are different from the Americans."

British Telecom, KDD and MCI introduced Commax last February during the Communication Network '90 conference in Washington, D.C.

Saving money

According to Niimura, Japanese firms are heavy users of facilities management services because they believe the service ultimately represents a less expensive and easier way to manage private networks.

He added that Nichi Men's subscription to Commax services could be seen as an example of this.

As part of its subscription to Commax, Nichi Men uses multiple dedicated analog lines to carry voice, data and facsimile traffic from its New York office to a Commax network hub here.

MCI multiplexes this traffic onto dedicated 64K bit/sec circuits connecting the Commax hub here to Commax hubs in London and Tokyo.

Network traffic flows from the overseas Commax hubs to Nichi Men offices in the U.K. and Japan via dedicated analog and digital links.

These overseas hubs are maintained by British Telecom and

(continued on page 28)

Every Commax user to date, except for two, is a Japanese firm with U.S. operations.

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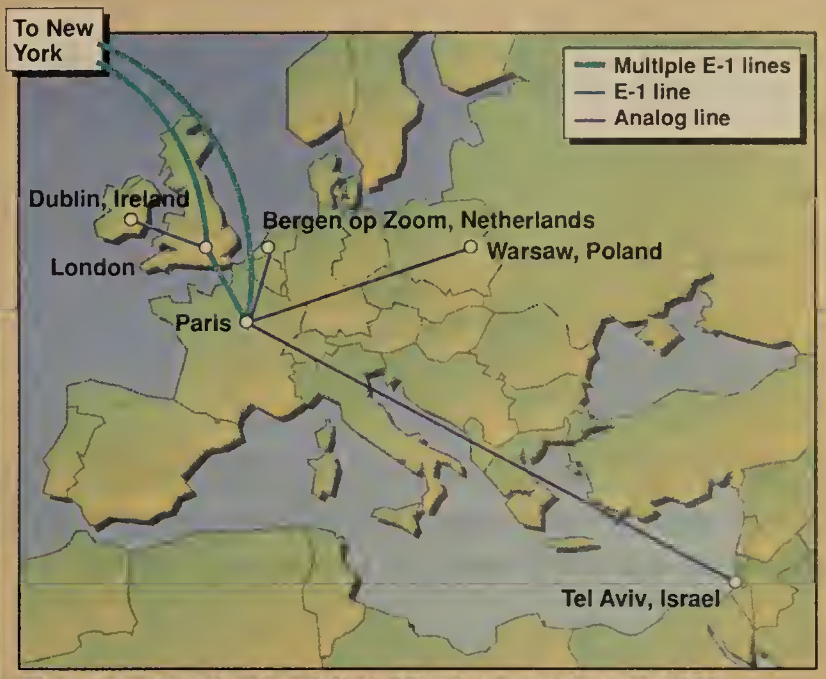

The international network that GE cut over in January 1990.

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: GENERAL ELECTRIC CO., FAIRFIELD, CONN

GE net exec pleased with new global net

Says 1-year-old network satisfies firm's needs by providing links between U.S., European staff.

By Barton Crockett
Senior Editor

BRIDGEPORT, Conn. — One year after cutting over a high-profile international network, General Electric Co.'s top network manager says it has become a vital business tool.

By using multiple T-1, European T-1 and analog lines to carry voice, facsimile, data and video traffic between GE's domestic sites and major European locations, the international net is making it easier for European employees to communicate with one another and with U.S. business units (see graphic, this page).

"What this does is make us a more integrated company," said Stan Welland, GE's director of corporate communications. "And we think that's good because our international business is growing tremendously."

The carriers that support GE's international net — AT&T, France Telecom and British Telecommunications PLC — are so pleased with the deal that they plan to use it as a model for other users.

"What we're now saying to users is that we're working to offer them the same kind of deal we gave GE," said Gabriel Sidhom, director of marketing in France Telecom's New York office.

Never before have these three carriers worked so closely with one another to design, sell and service an international network for a user, they claim.

For his part, Welland says he

(continued on page 28)

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See The FAXNeT Form on Page 28

Japanese are big users of Commax

continued from page 27

KDD. All three carriers monitor and maintain the network links in Nichi Men's network 24 hours a day. Niimura said this keeps him from worrying about the task. He added that MCI also keeps detailed call records that Nichi Men can use for chargebacks.

"Basically, it makes my job easier," he said.

Simple and cost-effective

Niimura added that, arguably, Commax costs Nichi Men less money than the company would spend to manage the net itself. This is because Nichi Men doesn't have to invest in the floor space, maintenance services and staff resources needed to maintain a private net.

Niimura said it could be argued that these savings offset the extra money Nichi Men spends to lease equipment rather than purchase it outright.

Noriaki Matsuda, a computer engineer with Kyowa Bank in New York, agreed with Niimura's analysis. Kyowa Bank is a unit of Tokyo-based Kyowa Bank, Ltd., which recently signed a three-year, $1.3 million contract with MCI for Commax services.

"Japanese firms find this kind of arrangement to be a very simple and cost-effective way to have a network, so they use it quite widely," he said. ☒

GE net exec pleased with new global net

continued from page 27

Stan Welland

couldn't be happier with the service provided by the carriers. This is critical because GE relies extensively on the carriers to house, service and maintain the equipment supporting the international net.

"This network might be somewhat unique in the degree to which we rely on the carriers to support it overseas," Welland said. "We didn't want to deploy our own personnel over there because the payroll expense can be quite large."

According to Welland, before GE cut over the international net in January 1990, the company operated a hodgepodge of 9.6K bit/sec links carrying data traffic between the U.S. and Europe.

However, those lines were not integrated into GE's private domestic network and could not be effectively managed from GE's network control center in Princeton, N.J., he said.

For voice and facsimile traffic, GE relied primarily on standard international switched services. By contrast, the new network integrates voice and data and can be centrally managed from the U.S. For example, GE employees in Princeton can use Timeplex, Inc.'s Time/View 2000 element management system to monitor and control Timeplex multiplexers supporting the international links. This gives network personnel an end-to-end view of the performance of the international net.

Private branch exchanges in foreign offices are tied into GE's corporatewide, 7-digit dialing plan so that calling overseas is just as easy as calling within the U.S. Four overseas videoconferencing rooms are also linked to the net so GE can now support extensive videoconferencing between the U.S. and Europe.

Welland said about 50% of the traffic on the international network is voice and facsimile, 40% is data and 10% is video.

One sign of how the net is increasing communications between GE's overseas locations and the U.S. is the growth in voice and facsimile traffic, now rising by about 10% a month on the international net. Previously, GE's European and U.S. units seldom called each other because of the expense and difficulty of placing international calls, Welland said.

Welland said videoconferencing also provides a good example of how the international net is increasing corporate integration. Before installing the international network, GE didn't support any international videoconferences, he said.

Welland said GE employees now use videoconferencing virtually all the time. "They might as well be in the same room," he said. "The efficiencies are tremendous because they don't have to spend 24 hours on a plane and recuperate from [traveling among] different time zones."

Over the next few years, Welland said, he expects video usage to rise dramatically and to eventually consume as much as 30% of the bandwidth on the international net.

GE plans to further enhance corporate integration by installing a centralized voice mail system in Europe this year that will support voice messaging for business units throughout the continent. This voice mail system will be tied into GE's domestic voice mail system, making it easy for employees to send voice mail to coworkers in this country and around the world. Welland said only a handful of GE's European offices now have access to voice mail.

GE also intends this year to expand its international net by cutting over new broadband links to Australia, Japan and Singapore, as well as to Belgium, Germany, Italy and Spain. ☒

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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Cisco adds protocol translation to IGS

Internetworking supplier **cisco Systems, Inc.** last week said it has added a $900 protocol translation software option to its low-end Integrated Gateway Server (IGS) bridge/router.

The protocol translation software operates as a gateway and provides protocol conversion among network devices supporting TCP/IP, X.25 and Digital Equipment Corp.'s Local Area Transport (LAT) protocols.

Adding the option to an IGS bridge/router raises the unit's price to $6,595, but Bruce Byrd, cisco Systems' product manager, said the option is still cost-effective because it eliminates the need to buy a separate protocol converter.

Byrd said the protocol translation option will replace cisco Systems' own dedicated CPT protocol translator, which costs $10,925.

The software allows the IGS to be used in three ways.

First, with routing, bridging and protocol translation features activated, it can link multiple local-area networks over an X.25, frame relay or T-1 wide-area connection.

While TCP/IP and other protocols can be routed over the wide-area link, the protocol translator will packetize LAT traffic into X.25 or TCP/IP packets for transmission across the wide-area network.

LAT sessions are still maintained by a local LAT device and the IGS, protecting them from timing delays on the WAN. This also keeps LAT session status data on the local net, reducing traffic on the wide-area connection.

Second, even with the wide-area link established, the IGS can translate between TCP/IP and LAT traffic. In this mode, the device can support as many as 32 concurrent translation sessions.

Lastly, the IGS can be used as a dedicated protocol converter supporting 100 concurrent translation sessions.

The IGS protocol translation option will begin shipping in March.

Cisco Systems, Inc., 1525 O'Brien Drive, Menlo Park, Calif., 94025; (415) 326-1941.

Product aids Wang batch file transfers

By Jacqueline Emigh
Staff Writer

LEESBURG, Va. — Levit & James, Inc. recently unveiled Mass Transit, software that enables users to perform batch file transfers between Wang Laboratories, Inc. word processing systems and personal computers.

The software is especially useful for businesses migrating from Wang equipment to personal computers but that need to retain files archived on Wang systems for legal or other reasons.

Mass Transit resides on both systems and works in tandem with Macsoft Co.'s Lightspeed software, which enables personal computers to emulate Wang terminals and conduct the actual file transfer. The addition of Mass Transit will enable Lightspeed users to handle batch file transfers rather than fetch files one at a time with Lightspeed.

The Mass Transit software enables users to search Wang word processing files and group them according to user-defined parameters. Once that is accomplished, Lightspeed handles the actual file transfer of the batch file.

In order to set up a batch file transfer, a personal computer user sets up a terminal-emulation session with the Wang host and then accesses Mass Transit. Once the application is brought up, the user searches Wang word processing file directories and specifies on an electronic form which files it wants grouped into a batch file and transferred to the personal computer. Users can direct document searches by any summary field, including author, document name or comment.

Users can also define which documents should be transferred, as well as into which directories and word processing formats, such as WordPerfect Corp.'s WordPerfect or Microsoft Corp.'s Microsoft Word.

Mass Transit locates those files, converts them to the proper format and hands them off to Lightspeed, which transfers the files. A proprietary Wang interface links the personal computer to an I/O port on the Wang host.

Mass Transit is available immediately and is priced from $500 to $2,000 per Wang host.

For more information, Levit & James can be reached at P.O. Box 2503, Leesburg, Va. 22075, or by calling (703) 771-1549.

Software lets remote PC users access TCP/IP net

WAKEFIELD, Mass. — FTP Software, Inc. recently introduced a new version of its PC/TCP for DOS software that enables remote personal computer users to dial into a Transmission Control Protocol/Internet Protocol network to access files and services.

Version 2.05 of PC/TCP for DOS supports the Point-to-Point Protocol, an emerging standard for asynchronous serial line communications that enables users to maintain a single configuration for dialing into a server on a TCP/IP local-area network.

Until now, PC/TCP for DOS supported a serial line interface protocol (SLIP) that required users to change the software's communications parameters each time a user wanted to access a different server on the LAN.

Version 2.05 of the software also comes with a modem dialer so the computer can automatically dial into the network, instead of relying on the user to do so.

Version 2.05 of PC/TCP for DOS is suited for stand-alone computers at remote sites that are not part of a LAN or do not justify use of a leased line, according to James van Bokkelen, FTP Software's president.

PC/TCP for DOS is a collection of programs that implements TCP/IP support on personal computers. It provides File Transfer Protocol capabilities, Telnet terminal emulation, electronic mail and remote access services.

Version 2.05 of PC/TCP for DOS runs on DOS-based personal computers and interfaces with any third-party TCP/IP software running on a server or host.

Software access

Users access the software by entering a series of three commands: CALLUP, which dials the modem; CONNECT, which establishes the connection to the TCP/IP network; and PC/TCP, which enables the host and remote computers to communicate.

PC/TCP for DOS Version 2.05 costs $400.

For more information, contact FTP Software at 26 Princess St., Wakefield, Mass. 01880-3004, or call (617) 246-0900.

Market sees surge in Mac adapter options

Vendors vie for foothold with adapters that link Macintoshes to 4M/16M bit/sec token-ring LANs.

By Jacqueline Emigh
Staff Writer

A rash of network adapters linking Apple Computer, Inc. Macintoshes to 4M bit/sec and 16M bit/sec token-ring local-area networks has hit the market recently.

The products ease the integration of Macintoshes into departmental token rings and high-speed token-ring backbones, vendors said.

Cabletron Systems, Inc., h-three Systems Corp. and Tri-Data Systems, Inc. have rolled out 4M/16M bit/sec token-ring adapters for Macintosh II and Macintosh LC models.

Cabletron's card

Wiring hub vendor Cabletron announced its Macintosh II Token Ring Desktop Network Interface (DNI) at the recent MacWorld Expo conference in San Francisco.

Using shielded twisted-pair or unshielded twisted-pair wiring, the DNI card links Macintosh II computers to 4M or 16M bit/sec token-ring LANs.

The card features built-in net management and diagnostic capabilities, enabling users to gather, transmit and receive statistics that reveal the computer's ability to access the network.

The card can be managed by Cabletron's Spectrum and Remote/Lanview/Windows net management systems.

As with the company's other DNI cards, the token-ring version supports Cabletron's Lanview Status Monitoring and Diagnostic System. This enables users to determine whether individual nodes have gained access to the network, the speed at which data is transmitted and the transmission status of an individual node.

Cabletron's Macintosh II Token Ring DNI card is available now at a cost of $1,295.

For further information, contact Cabletron at 35 Industrial Way, P.O. Box 6257, Rochester, N.H. 03867, or call (603) 332-9400.

MacRing makes debut

Earlier this month, h-three Systems unveiled its MacRing NB 16/4 network adapter, which connects Macintosh IIs to 4M and 16M bit/sec token rings.

The interface, which is based on a Texas Instruments, Inc. 4M/16M bit/sec token-ring chipset, uses a specially developed ring interface to eliminate the network jitter problems of earlier 16M bit/sec token-ring adapters.

The board supports Apple's TokenTalk technology, in which AppleTalk protocols are shipped over a token-ring network.

The MacRing NB 16/4 network adapter comes with onboard connectors for both shielded and unshielded twisted-pair wiring.

The card also comes with Macintosh MacRing Manager, built-in software that provides diagnostics and network management software. Network speed is hardware- or software-selectable, according to h-three Systems.

The products ease the integration of Macs into departmental token rings.

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The MacRing NB 16/4 costs $995 and is available now.

Contact h-three Systems by writing to the company at 100 Park Drive, Suite 204, Research Triangle Park, N.C. 27709., or by calling (919) 549-9868.

Tri-Data's LanWay

Tri-Data Systems has also unleashed a version of its LanWay TR 16/4 network adapters designed to tie Macintosh LC systems to a token ring.

The LC-16/4 Token Ring Adapter is software-switchable between 4M and 16M bit/sec token-ring speeds and is based on TI's TMS380C16 communications processor.

The company claims that in the 4M bit/sec mode, the LanWay TR 16/4 is 25% faster than other network interfaces. The device also comes with 128K bytes of memory.

The LC-16/4 Token Ring Adapter costs $895 and is scheduled to ship in May.

For further information, contact Tri-Data Systems at 3270 Scott Blvd., Santa Clara, Calif. 95054, or call (408) 727-3270.

OPINIONS

MANAGEMENT STRATEGIES

BY MICHAEL ZURIK

How to shop in the communications supermarket

Managing information systems today has become like shopping in a supermarket. However, this supermarket does not contain food and household items, but rather a mind-boggling array of hardware, software, systems, communications conventions, protocols and topologies available in an endless variety of complicated designs and configurations. And the selections change daily.

Somehow, information managers must navigate through these aisles of technological alternatives, select materials and construct systems that will fit their needs.

To do that, they must find a way to contend with the information explosion.

> The sheer volume of technological data currently available can appear overwhelming.
>
> ▲▲▲

The sheer volume of technological data currently available can appear overwhelming. The number of journals, magazines, weeklies, monthlies, pamphlets and books describing products, inventions, trends, projections, enhancements, problems, bugs, standards and protocols ad infinitum could short-circuit any memory bank.

The dizzying speed at which technology changes can add to the sense of confusion one may feel. Without warning, the next significant event, product or system is upon us.

Communications professionals must somehow assimilate all this data. Like an archeologist uncovering writings in an ancient tomb, they must decipher the hieroglyphics of automation technology and make intelligent decisions.

What's the best strategy for coping with this? How do we shop for our communications needs amid such confusion?

Here are some possible strategies:

■ **Be selective.** You have to give up the idea of being knowledgeable about everything that's happening in the industry. Like good generals, we must pick not only our battles, but our targets of research and expertise as well. If possible, delegate responsibility for specific areas to others.

■ **Stay flexible.** Try to make choices that enable you to grow, choices that are as open as the system will allow. The days of proprietary environments seem to be ending — and none too soon.

■ **Remember that the business is evolving.** Could anyone have predicted the currents of change that have swept through the communications industry during the past 20 years? Can we imagine what will happen by 2000?

■ **Make decisions.** The mind-numbing complexity of managing information can often paralyze decision making. Because the available options are so numerous, choosing becomes difficult. Before you make important decisions, get as much input as possible. Think about the situation once, twice and even more if appropriate, but do decide. Mistakes happen; we read about them every day. But they often teach us more than our successes.

■ **Know your mission.** Probably the most important consideration is to continue to focus on your corporate and business goals, and to refrain from building systems or networks based on your own perceptions and prejudices.

This awareness has to be cultivated continuously. We might even let it be a decision-making polestar.

Zurik is an information systems manager for the Eastern region of the Federal Aviation Administration, based in Jamaica, N.Y.

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EDITORIAL

Technology alone can't give users a competitive edge

Last week's International Communications Association Winter Seminar in Houston focused on an important issue: building strong partnerships — not only with key suppliers, but also with end users, customers and upper management.

The application of leading-edge technology alone cannot ensure a competitive advantage. In fact, a competitive edge based solely on technology is likely to be fleeting.

What's needed is for employees at every level — including the network department — to build strong ties to customers, whether those customers be actual buyers of your company's products or the internal staff who rely on your services.

Jim Jewett, a featured speaker and cofounder of Telco Research Corp., emphasized that U.S. companies must constantly strive to provide service that not only meets their customers' needs but pleases the customer. In fact, "delights them" is the phrase he used. Service of this quality leads to customer loyalty and added profits.

For some network managers, partnering poses some real problems. Too many information systems professionals remain entrenched in the philosophy that their services are little more than overhead.

For these and all network executives, the challenge is to understand the real needs of end users, department managers, top executives and, most importantly, customers. The challenge is to get out on the front line — and to get staffers out there — in order to learn what other employees do and how customers see the company.

The challenge is to speak frankly with vendors about business goals and problems and to work with them to achieve goals. Strive to reward those vendors that step up to the partnership challenge and sever ties with those who can't or won't.

By finding out what customers view as excellent service and by understanding their problems, network executives can attempt to provide meaningful technology solutions. Only then can they arm employees with the tools that will really help them meet customers' needs.

And only by building healthy, realistic partnerships with end users, customers and suppliers can network executives give their companies a competitive edge that is constructed on something more solid than the shifting sands of technology.

The partnership concept may not be a new one, and the message of quality customer service is not new. But as we head into a recession of indeterminate length, they take on greater urgency. Technology alone cannot ensure success.

THE FCC

BY ALAN PEARCE

In a litigious environment, the whole industry loses

Credible verification now exists for the view that the Federal Communications Commission is on a losing streak in public policy issues that go before the higher courts.

Research recently completed by Robert Blau, director of policy analysis for BellSouth Corp., reveals that between 1935 and 1969, the FCC prevailed on nearly 87% of its common carrier policy issues reviewed by the higher courts. During the period from 1970 to 1978 — what might be termed the beginnings of competition — the FCC successfully defended 77% of its common carrier decisions.

In the following decade, from 1979 to 1989, the commission won only 70% of the court appeals. But since May 1986, when most of the decisions made by the Reagan-appointed FCC were appealed, the commission's success rate has further declined. It has won only 59% of the common carrier policies reviewed by the appeals courts since that time, according to Blau.

There are several possible explanations for this embarrassing performance.

First, the structure of the communications industry has become much more complicated over the past 20 years. In 1970, the First Computer Inquiry had just been formulated, equipment competition was just beginning to evolve after the FCC's Carterfone decision and MCI Communications Corp. had won its first public policy battle by getting permission to construct private-line microwave facilities from Chicago to St. Louis.

Today, there are literally hundreds of new players in the industry that were not around in 1970 — players that are prepared to fight not only before the FCC, but also before the courts and Congress. Indeed, industry pundits sometimes refer to MCI as a law firm with a microwave antenna on its roof.

Second, throughout the 1980s, the FCC was led by ideologues that knew little about the Communications Act of 1934 and the Code of Federal Regulations, Volume 47, which stemmed from it. Therefore, many of the FCC's policies were founded on political and, invariably, right-wing ideology, not on the law. However, the courts tend to interpret law as statutes enacted by Congress, not as ideology.

> The structure of the industry has become much more complicated over the past 20 years.
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Third, the 1980s saw a dramatic increase in public policy appeals that involved rate-making and accounting issues, with the FCC losing a high percentage of these. Generally speaking, the FCC is using its rate-making and accounting policies in an attempt to loosen the hold of the Communications Act — something only Congress has the authority to do.

Fourth, state regulators refuse to let the FCC dictate policy. For example, the California Public Utility Commission has been responsible for two recent FCC setbacks — the overturn of the Third Computer Inquiry and the regulation of FM subcarriers. Federal and state jurisdictional problems are bound to continue into the 1990s, unless Congress steps in and gives the FCC the power to preempt state policy.

Fifth, the divestiture of AT&T seven years ago added to the litigious public policy-making environment. Not only are AT&T and the regional Bell holding companies being sued by competitors, but they are also suing the FCC. In addition, the RBHCs are suing U.S. District Court Judge Harold Greene, who is still overseeing the divestiture and determining whether the RBHCs can enter new lines of business.

The communications industry is paying the price for the public policy conflicts that come before the courts. These battles inhibit technological and business innovation, and create confusion for the public at large.

If the FCC's court losses continue — and FCC Chairman Alfred Sikes appears determined to reverse the trend — pressure will surely build to update or modify the Communications Act of 1934. As Sikes says, "We have to struggle with an old law and outdated regulations stemming from that law. I am trying to do something about the outdated regulations, but I cannot do anything about the law; only the Congress can fix that."

The FCC should push Congress to amend the act so that the commission will have more latitude to accommodate technological, structural service and competitive changes as the information age evolves.

But the industry and users also have roles to play, most notably in the creation of a less contentious, less confrontational, less litigious environment. The disputatious environment has not been created entirely by Congress, the courts, the FCC and the state regulators. Several industry participants have contributed to the creation of the policy-making chaos and confusion — in many cases, merely to defend a narrow and selfish vested interest.

For public policy to do what it is supposed to do — promote public benefits for all — we must cultivate a business and political environment that is significantly less litigious than it has been over the past two decades. Otherwise, the FCC's losing streak will continue ad infinitum and we will all lose out. ◻

Pearce is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C.

TELETOONS

BY FRANK AND TROISE

Looks like I'll be building a user-vendor relationship from about noon to three today..

LETTERS

Revisiting GEdney

The Anti-Digit Dialing League that Bob Leipow refers to in his column "Looking back at life in the far-off land of GEdney" (*NW*, Dec. 24, 1990) had a potent weapon in its fight against dismissal of named telephone exchanges.

For example, when an operator would ask a company such as *Network World* for its telephone number, an Anti-Digit Dialer would respond, "five billion, eighty-eight million, seven hundred and fifty-six thousand, four hundred."

Recently, another organization has formed regarding the letters that appear on the telephone keypad. It's called The CitiZen's Quest to SQueeze Q and Z Back onto the Telephone Dial.

This consumer activist group favors the installment of Q and Z, which are currently absent, onto the dial in the 7 and 9 positions, respectively. Standards groups around the world, including the Consultative Committee on International Telephony and Telegraphy, are beginning to realize the potential for using push-button telephones as alphabetical data entry devices. Therefore, they believe it is necessary to complete the alphabet on the keypad.

However, the statement that "companies and individuals have been able to transform an astonishing number of numeric combinations into words" is in error. If you want a tricky telephone number like the Philadelphia plastic surgeon who specializes in liposuction and tried to get (800) SUCK-FAT, you have to start with the words and get the corresponding number.

Bernard Riskin
President
Fon-ex
Lambertville, N.J.

(More letters, page 44)

Network World *welcomes letters from its readers.*

Letters should be typed and double-spaced. Mail them to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

LIKE ALLIGATORS IN A SWAMP, unforeseen problems can really put the bite on your communications operation. Many managers wrestle with these net reptiles every day.

If you've survived an "alligator attack," share it with our readers by calling Susan Collins, assistant features editor, at (508) 820-7413 or fax your idea to us at (508) 820-3467. The article should tell how the problem was solved and what steps can be taken to prevent it. Alligators should be 1,200 words in length and submitted either on disk or via modem.

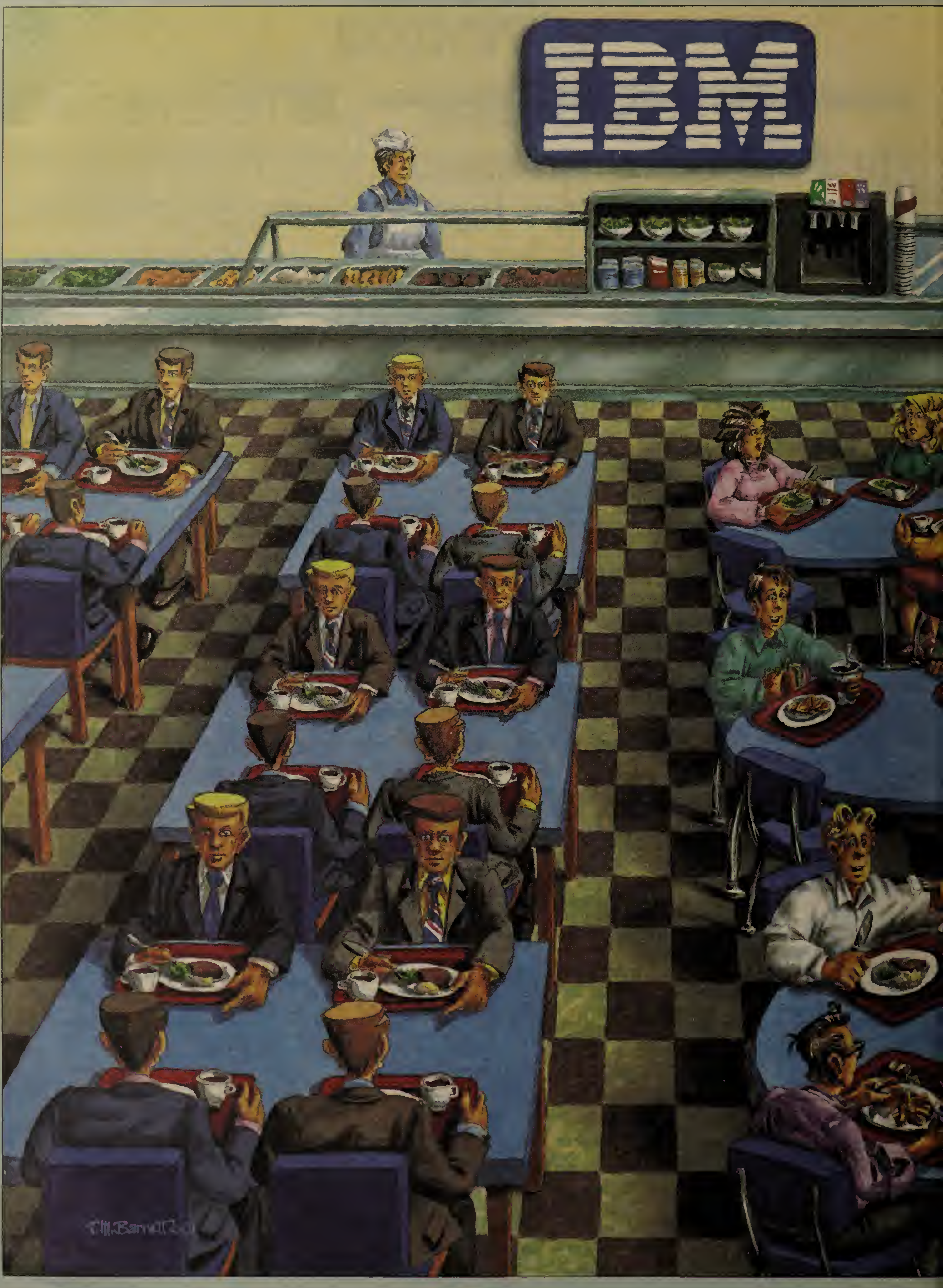

IBM

ILLUSTRATION ©1991 TOM BARRETT

Will OSI become 'the new IBM'?

CONTINUED FROM PAGE 1

the product was not to be available for another 1½ years.

As for the OSI inclusion in SAA, any IBM competitor or "industry specialist" would have told you at the time that SAA was no more than vaporware or a marketing ploy. And surely, when the product did become available, it would likely be an awkward patch over VTAM with enough proprietary locks to make it useless except for request-for-proposal purposes. So a big "ho-hum" was the general response to what IBM considered a dramatic announcement.

Well, that was then. IBM has since moved with an aggressiveness and speed that has surprised most industry pundits. It is a fair statement that IBM today provides one of the most extensive platforms among major system vendors for the development of OSI-based open systems.

To set the stage, let us begin with a review of OSI protocols that IBM has included in its SAA Common Communications Support. The OSI subset included in SAA identifies those protocols that IBM intends to implement on its System/370 and System/390, Application System/400 and Personal System/2 platforms (see Figure 1, page 34).

IBM provides a list of detailed profiles it intends to support to satisfy various OSI-complementary bodies. These profiles include the U.S. and U.K. Government OSI Profile, the Japanese Interoperability Technology Association for Information Processing and the European Norm by the Committee for Electrotechnical Standardization for the European Community. Of course, individual IBM products may implement broader sets of protocols in addition to those defined by SAA.

At the network level, X.25 support was already available when IBM made its SAA OSI announcement. What was new here was the inclusion under the SAA umbrella of the X.25 data terminal equipment (DTE)-to-DTE link, connectionless transport and local-area networks other than IBM Token-Ring.

(continued on page 34)

> Big Blue is moving quickly to integrate its traditional, proprietary systems with OSI-based products.

Kapoor is a principal with Kaptronix, Inc., a Haworth, N.J.-based consulting firm.

OSI protocols included in SAA

Figure 1

Layers	Protocols
Application 7	FTAM, ACSE, X.400, X.500, CMIP and CMIS
Presentation 6	Kernel and ASN.1
Session 5	Versions 1 and 2 of the International Standards Organization session protocols (all functional units)
Transport 4	Classes 0 (simple), 2 (multiplexing) and 4 (error detection and recovery)
Network 3	CLNS - Internet CONS - X.25
Data link 2	
Physical 1	

The OSI subset included in IBM's SAA identifies protocols to be implemented in IBM's S/370, S/390, AS/400 and PS/2 platforms. Individual IBM products may implement broader sets of protocols in addition to those defined by SAA.

ACSE = Association Contol Service Element
ASN.1 = Abstract Syntax Notation 1
CLNS = Connectionless Network Services
CMIP = Common Management Information Protocol
CMIS = Common Management Information Services
CONS = Connection-Oriented Network Services
FTAM = File Transfer, Access and Management
SAA = Systems Application Architecture

GRAPHIC BY SUSAN SLATER

SOURCE: KAPTRONIX, INC., HAWORTH, N.J.

(continued from page 33)

The transport-layer features available under SAA include Classes 0 (simple), 2 (multiplexing) and 4 (error detection and recovery). The session-layer services available include support for all functional units of Versions 1 and 2 of the ISO session protocols. The presentation-layer protocols include the Kernel and Abstract Syntax Notation 1 (ASN.1).

Application-layer protocols are the Association Control Service Element (ACSE), File Transfer, Access and Management (FTAM), X.400 message handling, X.500 directory services, Common Management Information Protocol (CMIP) and Common Management Information Services (CMIS).

The OSI/CS product family

IBM considers OSI/CS to be its strategic foundation for providing OSI functions on various SAA platforms. It is really a family of products, including one OSI/CS for each of the SAA platforms (see Figure 2, this page).

OSI/CS provides support for Layers 1 through 3 of the OSI model. It is a common worldwide offering, erasing any differences between IBM products in various international and domestic markets. The product also provides a common foundation for users, IBM and software vendors to develop OSI applications.

OSI/CS is an architected product in more ways than one. It consists of a base component that is machine- and operating system-dependent and deals with environment-specific issues. The OSI layers are implemented in a machine-independent form using Pascal. Thus, the same software is used for layer functions on all SAA platforms.

Even though the software architecture of OSI/CS is generally transparent to users, this approach, in IBM's view, provides for much more robust software and ensures uniformity across platforms.

Also, the application program interfaces (API) to invoke services of OSI/CS are uniform across SAA platforms, enabling easier development of multiplatform OSI applications for users, IBM and other software vendors.

OSI/CS connectivity

Figure 3 on this page shows various connectivity options for accessing OSI/CS. For wide-area connectivity to other IBM or non-IBM open systems, OSI/CS requires the use of X.25.

IBM's Network Control Program (NCP) and NCP Packet-Switching Interface software provide an X.25 gateway between the mainframe and the X.25 network. AS/400 and PS/2 also provide X.25 support, with or without OSI/CS.

Connectivity is available for Ethernet LANs through the new IBM 3172 interconnect controller. Currently, the 3172 can connect only with a System/370 or System/390 I/O channel. Thus, no remote LAN connectivity is available for OSI/CS on System/370 or System/390 unless the user is willing to use a non-IBM transparent remote bridge.

IBM has indicated that it intends to expand the 3172 connectivity for token ring and token bus. However, it is noteworthy that "the new IBM" chose to provide an interface for Ethernet ahead of its own Token-Ring Network architecture.

Perhaps it should also be mentioned that the intended role of the IBM 3172 is much broader than simply providing connectivity for LAN-based OSI applications; it is also the primary means for connecting Transmission Control Protocol/Internet Protocol applications to IBM hosts.

Lastly, independent of both OSI and TCP/IP, the 3172 interconnect controller also may be used for remote channel-to-channel connectivity between IBM mainframes over T-1 links.

OSI/CS APIs

For programmers, OSI/CS provides access to three levels of OSI functions: session, presentation and application.

The application and presentation programming interfaces are available in COBOL and C languages. The access to session services is available only in Assembler language.

The expectation is that most user-written applications will need to deal with only the upper two layers and access to session services will be needed for more technical (system-type) programs where familiarity with Assembler would be more common.

Applications using OSI/CS can allow OSI/CS to manage underlying sessions or may control the sessions directly using the session-level API. There is a 1-to-1 relationship between associations and sessions. (An association is an application-level connection in OSI.)

Using the OSI/CS services, a programmer can organize application processing in events and dialogs. An OSI event is completed by the occurrence of a major synchronization point, which is the restart point after a system failure.

An event can be further divided into multiple dialogs, where each dialog is bound by minor synchronization points.

Within an event, a session can be resynchronized to a specific dialog. However, the session may not be resynchronized beyond a single event. Events and dialogs thus define the scope of recoverability within a session. The use of events and dialogs is optional under OSI, and OSI/CS permits development of programs with or without events.

OSI/CS session services provide support for session establishment, termination, events, dialogs and full-duplex/half-duplex flows. Data flows outside OSI events are permitted by the use of capability data. This feature is useful for transmitting small amounts of data, called capability data, without incurring the overhead of setting up an event.

Support is also provided for expedited flows (high-priority data) and typed data (data units that can flow against the constraints of a half-duplex session state) as defined under OSI. Tokens required for the above functions are also supported.

Specific session services used depend upon application requirements, and their selection is a part of the application design. Of course, both sides of a session must support the required function sets for a particular service to be available.

Presentation services

Presentation services under OSI/CS deal primarily with the management of ASN.1, which is the OSI method of defining data structures so that various open systems can interpret one another's data streams. Some ASN.1 data types are Boolean, integer, bitString, OctetString, NumericString and PrintableString.

OSI applications must describe their data structures in conformance with the ASN.1 rules. One problem with ASN.1 is that data type declarations are not embedded in today's compilers and require application programmers to learn a whole new data-defining syntax.

To alleviate the burden of ASN.1 requirements, IBM provides an off-line utility called the ASN.1 Syntax Checker (ASC). With ASC, a small group of programmers in an organization can provide ASN.1 expertise to other OSI application programmers.

The application programmers provide their data details to the ASN.1 experts, who encode the ASN.1 statements. The ASN.1 statements are then processed by the ASC, which generates the appropriate C or COBOL data definitions that can be included directly in the application program. For details on application services, see "OSI application services," page 35.

APPC in both camps

OSI and SNA's Advanced Program-to-Program Communications both permit peer application development.

Conceivably, users may want to develop applications using both architectures, depending upon whether an application could run more optimally using APPC or OSI.

Selected IBM OSI products

Figure 2

Product	Availability	Price*
OSI/CS, MVS, Release 1	March 30, 1990	$80,130 to $140,130
OSI/CS, VM, Release 1	May 25, 1990	$9,985 to $144,000
OSI/CS, MVS, Release 1.1	Nov. 16, 1990	$83,330 to $227,700
OSI/CS, VM, Release 1.1	Dec. 21, 1990	$10,380 to $198,400
OSI/CS/2 (OS/2 Extended Edition)	March 29, 1991	$750
OSI File Services (MVS)	June 1990	$48,000 to $72,900
OSI File Services (VM)	Sept. 1990	$6,090 to $69,930
Open Network Distribution Services, MVS	Dec. 1990	$5,325 to $109,700
Open Network Distribution Services, VM	March 1991	$3,150 to $109,700

*Actual price within the given range is dependent on processor models. Prices indicate onetime basic charges only, and special low prices, starting at $6,750, are available for entry-level (IBM 9370) users.

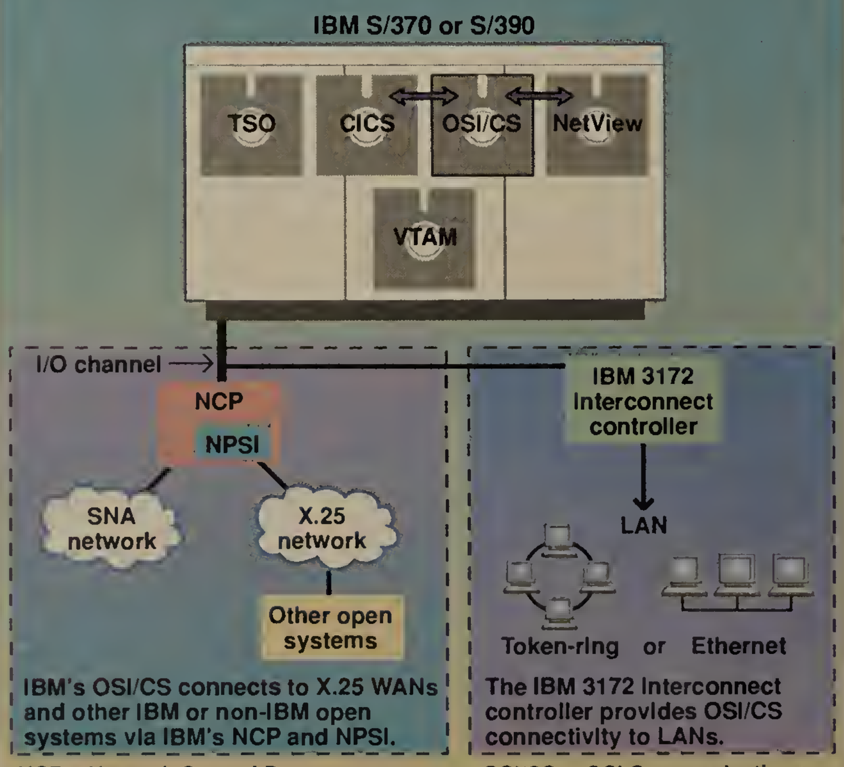
OSI/CS = IBM OSI Communications Subsystem

GRAPHIC BY SUSAN SLATER

SOURCE: KAPTRONIX, INC., HAWORTH, N.J.

OSI/CS connectivity options

Figure 3



IBM's OSI/CS connects to X.25 WANs and other IBM or non-IBM open systems via IBM's NCP and NPSI.

The IBM 3172 Interconnect controller provides OSI/CS connectivity to LANs.

NCP = Network Control Program
NPSI = NCP Packet-Switching Interface
OSI/CS = OSI Communications Subsystem

GRAPHIC BY SUSAN SLATER

SOURCE: KAPTRONIX, INC., HAWORTH, N.J.

The IBM Common Programming Interface for Communication (CPIC) defines the SAA API for communications functions. CPIC provides a common interface for both APPC and OSI applications.

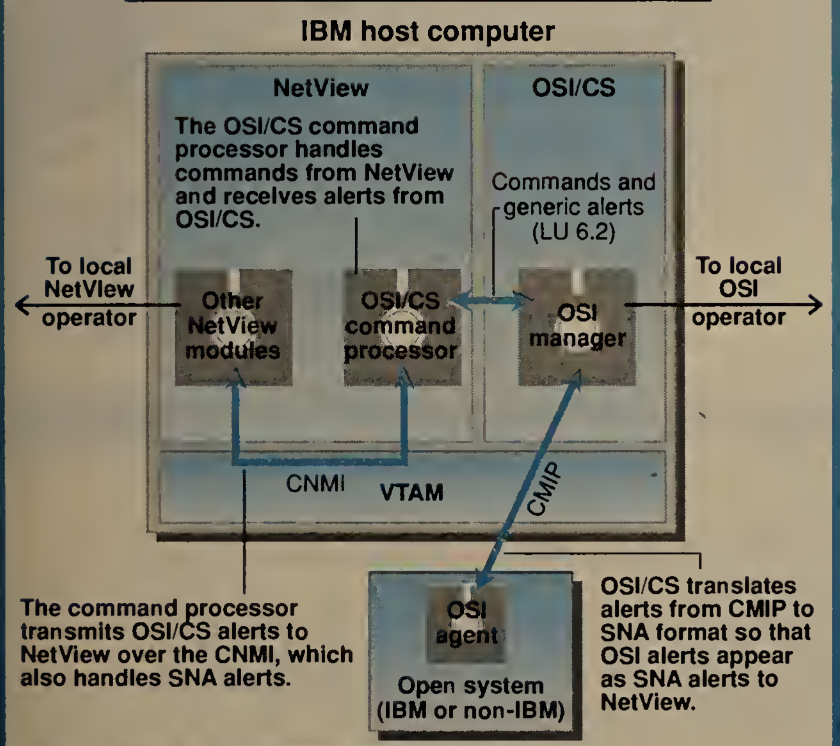
Products supporting CPIC would be capable of determining — based on system administration information — whether an application is using an APPC or OSI connection. They would then convert the application service calls to the appropriate architecture. Thus, CPIC eliminates the need for a programmer to know whether the underlying architecture is OSI or SNA.

OSI/CS provides direct support for CMIP, CMIS and a control operator interface. In addition, as shown in Figure 4 on this page, OSI/CS provides an interface to NetView so that OSI alarms can be integrated with SNA alarms under NetView. The human NetView operator can also exercise control over the OSI resources; however, as shown in Figure 4, NetView does not support CMIP and CMIS directly.

With OSI/CS, IBM also provides a NetView command processor, which resides in NetView and processes NetView commands for OSI/CS as well as receives alarms from OSI/CS.

OSI/CS systems management

Figure 4


IBM host computer
NetView
OSI/CS
The OSI/CS command processor handles commands from NetView and receives alerts from OSI/CS.
Commands and generic alerts (LU 6.2)
To local NetView operator
Other NetView modules
OSI/CS command processor
OSI manager
To local OSI operator
CNMI
VTAM
CMIP
The command processor transmits OSI/CS alerts to NetView over the CNMI, which also handles SNA alerts.
OSI agent
Open system (IBM or non-IBM)
OSI/CS translates alerts from CMIP to SNA format so that OSI alerts appear as SNA alerts to NetView.

OSI/CS = IBM OSI Communications Subsystem
CMIP = Common Management Information Protocol
CNMI = Communication Network Management Interface

GRAPHIC BY SUSAN SLATER SOURCE: KAPTRONIX, INC., HAWORTH, N.J.

The alarms received from OSI/CS are presented internally to NetView over the Communication Network Management Interface (CNMI) by the OSI/CS command processor. CNMI is the same interface over which NetView receives SNA alarms. Translation of alarms from CMIP to SNA format is done by OSI/CS so that OSI alarms appear to NetView as regular SNA alarms.

Other IBM OSI platforms

On Sept. 18, 1990, IBM also announced OSI/CS/2 for the OS/2 Extended Edition, extending its OSI capability to the desktop.

The product, which is scheduled to be available on March 29, provides similar capabilities to the mainframe OSI/CS products described earlier. OSI/CS/2 would require a minimum of 10M bytes of main memory and 70M bytes of hard disk for a practical configuration. IBM does not intend to provide OSI support in a personal computer DOS environment.

With the addition of other OSI applications such as FTAM and X.400, the memory requirement is sure to increase. On Sept. 18, 1990, IBM also made a statement of direction noting that it intends to provide a similar product for the IBM AS/400.

> The only way to run OSI applications on an IBM network is via OSI/CS.
>
> ▲▲▲

Applications without OSI/CS

The only way to run OSI applications on an IBM network is via OSI/CS.

However, OSI/CS may not be available on each IBM host for one of two reasons: cost and the VSE operating system.

Regarding the cost, it may not be economically feasible to put a copy of OSI/CS on each mainframe. And as far as VSE is concerned, the operating system is not a part of SAA and IBM has no commitment to provide OSI/CS for VSE systems.

When no OSI/CS is available on a host, IBM provides the VTAM OSI Remote Programming Interface for OSI applications. Using this product, users can run OSI applications on any host with the VTAM OSI Remote Programming Interface as long as there is at least one host in the network that contains OSI/CS.

Applications based on the Remote Programming Interface can communicate with other OSI applications only via the OSI/CS host, with the OSI/CS host acting as a relay.

Obviously, users will have to analyze cost vs. performance trade-offs to determine whether this is a viable option.

Other OSI services available from IBM include:

■ **X.500.** One of the key requirements for association management is the need for a directory that includes items such as descriptions of local and remote application entities, their addresses and other parameters. OSI/CS provides this function via its OSI-based X.500 directory support.

However, IBM's X.500 support entails much more than just managing local and remote application directories. It provides support for a centralized directory, as well as a distributed directory architecture, and includes support for both client and manager functions.

The central directory function of the IBM X.500 directory can be accessed by both IBM and non-IBM products, and conversely, IBM's X.500 support can act as a client function to obtain its directory information from non-IBM X.500-based directory services.

■ **OSI/CS File Services.** This OSI/CS-based product provides FTAM support. Working with another IBM or non-IBM FTAM system, OSI/CS File Services can create, delete and move files, as well as inspect and modify file attributes. It provides both client and server functions.

Application program interfaces (API) to OSI/CS File Services are available in C and COBOL. This product is currently available for MVS and VM, and is scheduled to be available for OS/2 Extended Edition in June 1991.

■ **IBM Open Network Distribution Services.** This product represents IBM's X.400-based messaging services and replaces its non-OSI/CS-based Open Systems Message Exchange and the X.400 Message Transfer Facility products the vendor announced just 1½ years ago.

The new product also has interfaces to existing IBM electronic mail and office automation products such as Professional Office System, DISOSS and OfficeVision. Again, C and COBOL APIs are available. Figure 2 on page 34 shows product availability and cost.

Cost of OSI

As Figure 2 indicates, the cost of installing basic OSI/CS software alone can run anywhere from $750 for a personal computer to $6,750 for an entry-level IBM 9370 host all the way up to $227,700 for the largest mainframes. These are single-site costs and do not include maintenance charges.

For a typical mainframe, such as an IBM processor Group 60, the cost of OSI/CS with FTAM and X.400 support would be approximately $265,000. To this price, the user must add the cost of distributed licenses on additional mainframes and personal computers.

All these costs do not include any other software — such as MVS, VTAM, NCP and NetView — or hardware upgrades that are required for OSI/CS.

For users considering desktop OSI applications, the IBM software is guaranteed to work only on the fully featured "True Blue" IBM PS/2. Then those users must add the cost of processing overhead to the performance of existing applications. On top of that, there will be the cost of training personnel and developing new OSI applications.

Thus, on the face of it, IBM's OSI solution is going to be a fairly expensive proposition for users.

Will OSI be any less expensive on non-IBM platforms? Probably. How much cheaper? That's difficult to say because no other OSI solutions are available with comparable functions on comparable platforms.

The future

The cost of implementing OSI on IBM platforms gives users reason for concern. Whether that cost can be justified will depend on each enterprise's needs and objectives. Perhaps IBM will be forced to revise its OSI/CS cost structure, as it recently did with NetView.

Nonetheless, IBM is clearly positioning itself to be a leader in providing OSI-based solutions. As a symbolic gesture of its commitment to OSI, IBM has moved its communications headquarters to Europe, where it believes an early OSI market will develop.

Beyond the symbolic value of this expensive gesture, it remains to be seen how this move will help IBM achieve results that it could not achieve otherwise. What is unquestionable, however, is that IBM is allocating a much greater share of its development budget to OSI than to SNA. The IBM OSI product barrage will continue.

Let's see if the marketplace, outside of government entities, will place its money where its mouth is. ◻

OSI application services

The Open Systems Interconnection model is designed to facilitate communications between peer application entities. The logical connection between application entities is called an association. The term "application," as used in the OSI model, is not a user-written business application, but rather a software module that provides application services to the business application.

The components of the application layer that provide these services are called Application Service Elements (ASE). The fundamental service element in the application layer is the Association Control Service Element (ACSE), which provides services to start and terminate associations.

During the association formation, the association partners agree on the OSI subsets that will be supported. This process is similar to the Systems Network Architecture Bind process during logical unit-to-logical unit session establishment.

However, the task of developing OSI applications involves more than simply learning the application program interface.

As was noted before, OSI applications involve peer relationships and thus distributed processing. The greater part of designing OSI applications will involve learning the implications of OSI protocols: session activities; dialogues; association control, including who starts an association and who terminates it; and full- vs. half-duplex applications.

Multivendor environments will also require ensuring compatible function sets and profiles. Finally, there is the actual distributed application design and software development, testing and the need for problem determination tools that work across multiple platforms cooperatively. Such tools, however, are not available yet.

These are some of the same factors that have inhibited the growth of Advanced Program-to-Program Communications applications even in the fairly homogeneous SNA environment. Thus, the availability of OSI/CS alone may not be sufficient for the availability of distributed open applications across multivendor environments. Early OSI applications will likely be vendor-provided.

— *Atul Kapoor*

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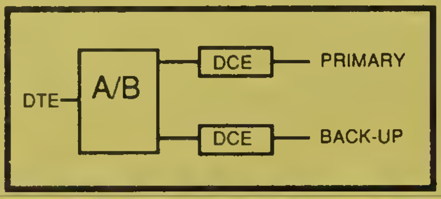

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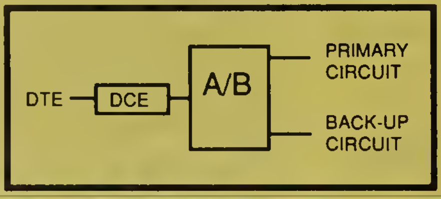

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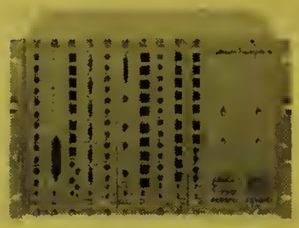

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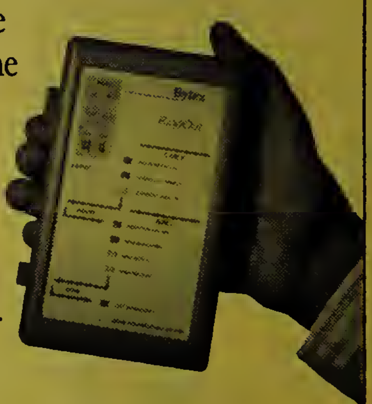

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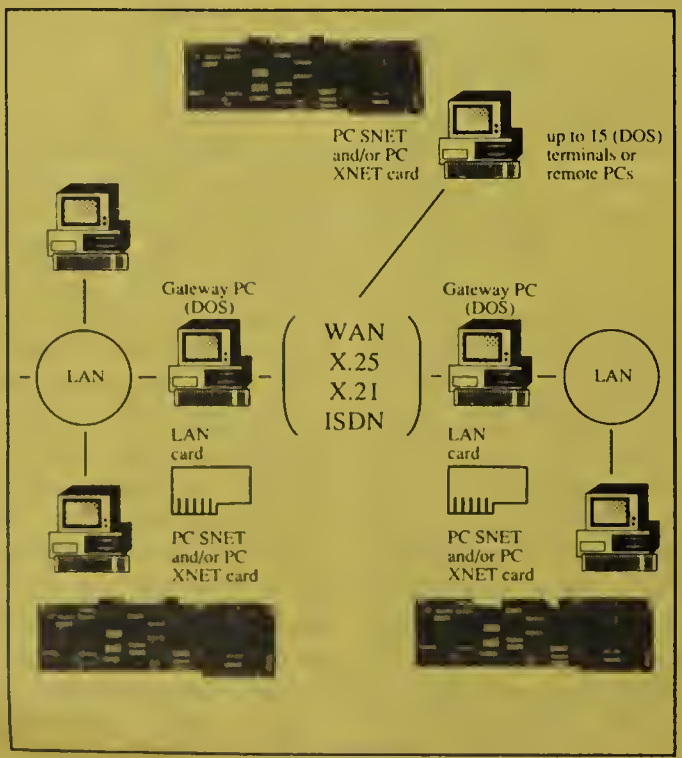
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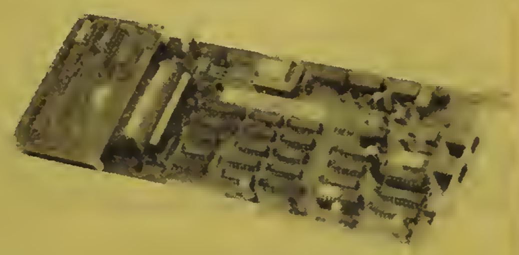

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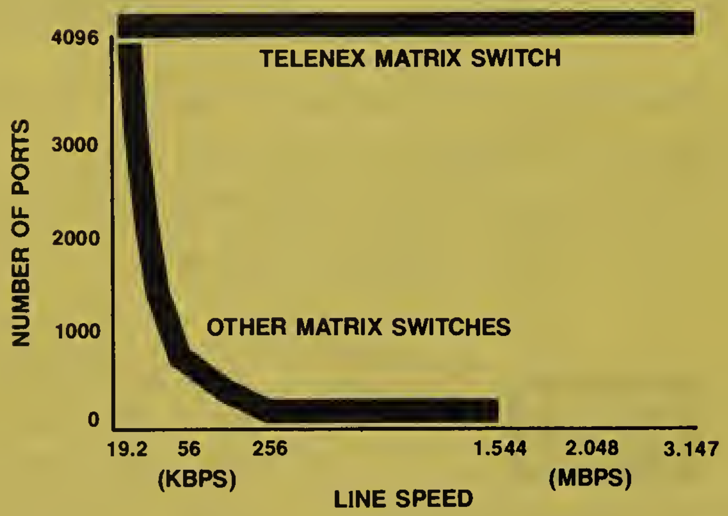

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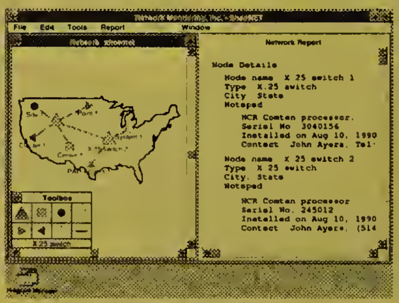

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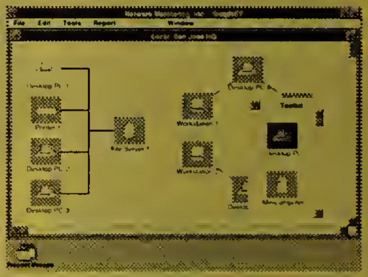

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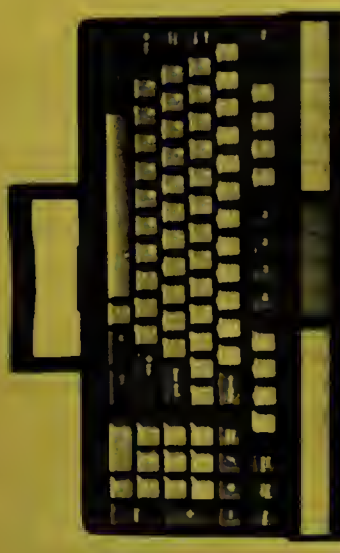

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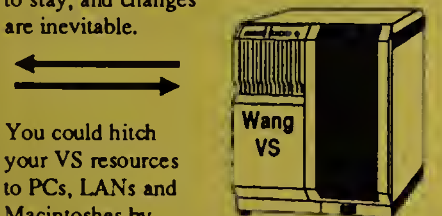

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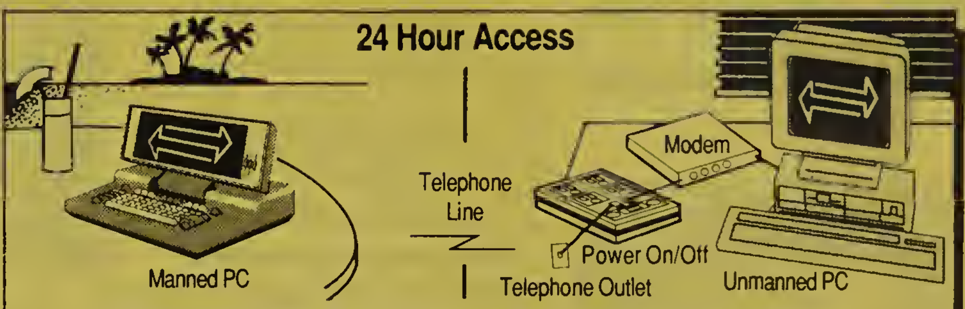

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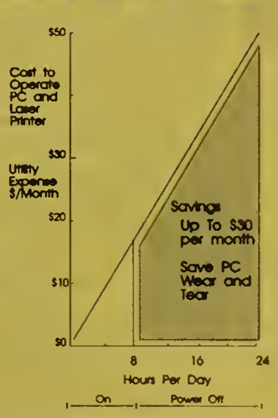

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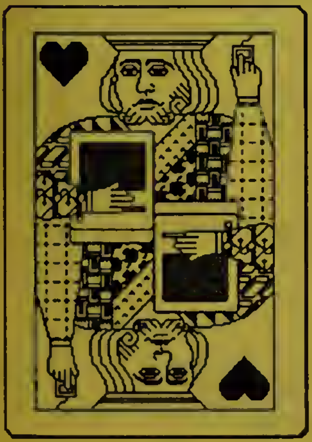

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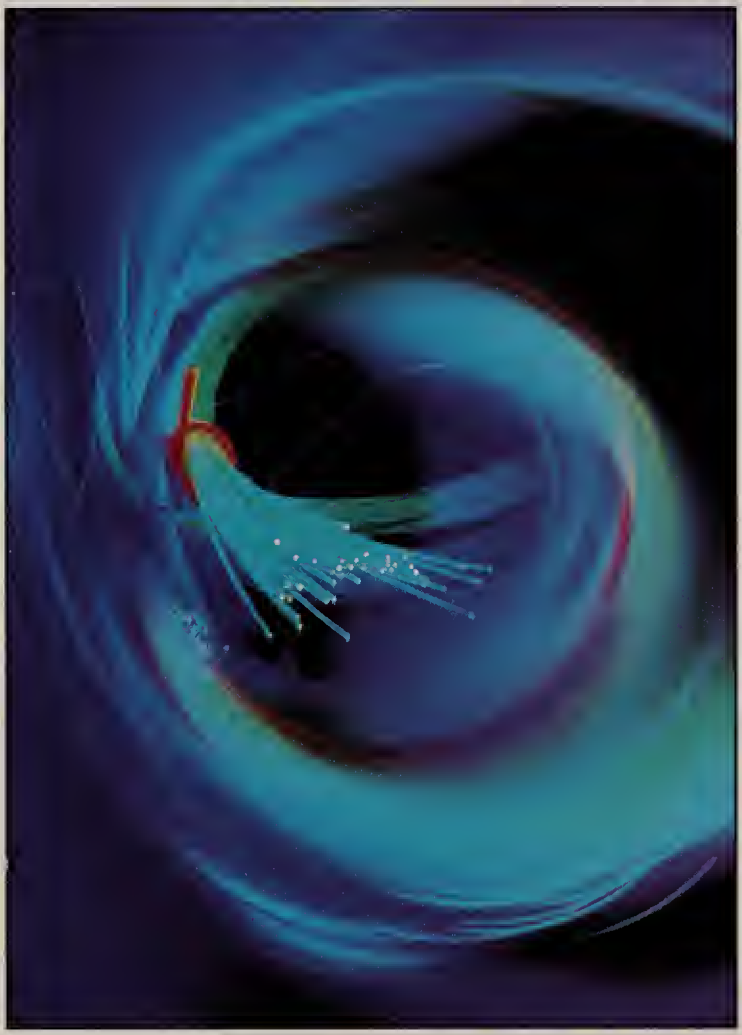

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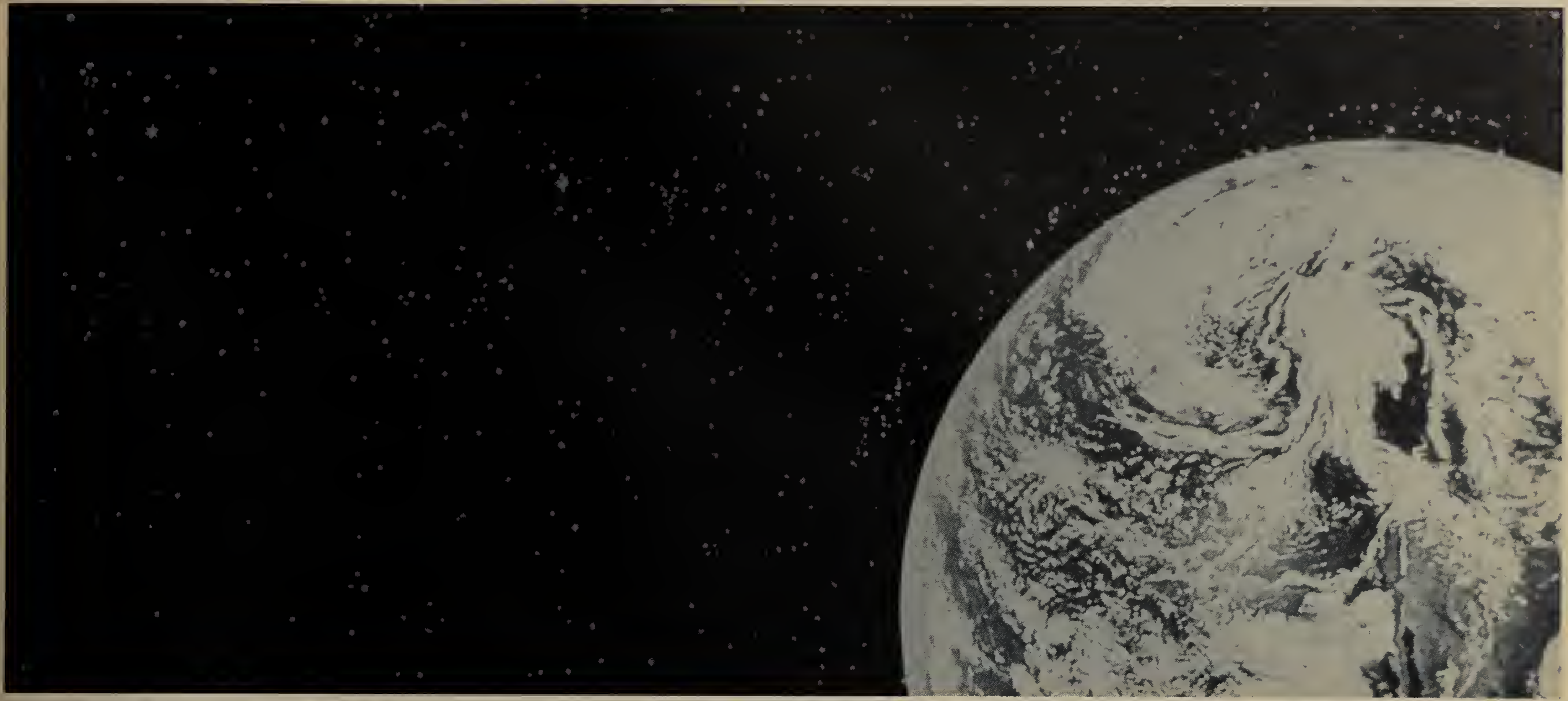

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NWWT

Development tools for OLTP bow

continued from page 1

running different DBMSs, said Peter Kastner, vice-president of the Aberdeen Group, a consulting and market research firm in Boston. "We need tools like Transarc's in order to implement distributed transaction processing applications," Kastner said. "Current technology won't do it because all of today's transaction processing systems are obsolete for developing applications that use the client/server model."

Transarc's tools are based on the Open Software Foundation's Distributed Computing Environment and X/Open Company, Ltd.'s emerging Distributed Transaction Processing (DTP) standard.

The Distributed Computing Environment comprises tools that enable developers to break applications into several components and distribute them across systems in a network. It also provides a set of standard application program interfaces (API) and services, including a remote procedure call (RPC), that let those components work together as if they were on one machine.

DTP defines the features and functions distributed OLTP monitors and applications must have, as well as a set of APIs that can be used to link different vendors' DTP-compatible software.

IBM will use the tools to develop a version of its mainframe-based CICS transaction processing monitor for AIX — its implementation of Unix.

Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C., said IBM told analysts it will probably use the Transarc tools to add support for Distributed Computing Environment to its existing version of CICS, which currently runs on IBM mainframes.

This would enable IBM to bring a distributed OLTP monitor under its Systems Application Architecture, a blueprint for building links between applications running on its line of architecturally distinct processors.

Dzubeck added that both HP and Stratus officials said they intend to use the tools to build Distributed Computing Environment support into their existing OLTP products. DEC is also said to be interested in the Transarc tools.

"This is an enabling technology that will let vendors take existing products, like CICS, and distribute them using [Distributed Computing Environment's] standard RPC as the underpinning," Dzubeck said.

Transarc's announcement comes a week after NCR Corp. introduced its distributed OLTP monitor, called Top End ("NCR tool helps users build OLTP applications for Unix," *NW,* Jan. 14). Although NCR's product is being based on X/Open's DTP, it embraces a large amount of proprietary technology built into NCR's existing Multi-Tran OLTP monitor, analysts said.

Transarc's tools pave the way for development of standard products that could help meet user demand for more functional OLTP systems, said Jim Johnson, president of Standish Group International, Inc., an OLTP consultancy in Hyannis, Mass.

One of the key elements in Transarc's tools is support for Distributed Computing Environment's RPC. Transarc said it will extend that RPC to support transmission of transactions between OLTP applications on client workstations and servers running distributed OLTP monitor software. This extended RPC will run over networks supporting Open Systems Interconnection, Transmission Control Protocol/Internet Protocol and X.25.

Lawmakers try takeover block

continued from page 4

$2 billion on its computer ventures since divestiture," the Ohio congressmen said, adding that they believe that revenue from long-distance operations has been used to cushion these losses. "If the merger [with NCR] does not work, the cost of repaying the $6 billion that AT&T is borrowing is likely to be borne by long-distance telephone consumers," they said.

Due to NCR's strong position in transaction processing equipment, the Ohio lawmakers said they feared the takeover might leave AT&T with too much power in the financial services market.

"A combination of AT&T's Universal Card and dominant position in long-distance telephone services with NCR's automated teller machines and point-of-sale credit card verification equipment gives AT&T the potential to develop an unfair advantage," the congressmen said.

Markey gave the FCC a deadline of this Friday to respond to his letter. In addition to raising specific concerns about the effect of an AT&T takeover on FCC proceedings and AT&T services, Markey asked what approvals — if any — the FCC would have to give AT&T and whether the FCC might prohibit completion of the takeover until its takeover review, if there is a one, is completed.

However, it is unclear whether the FCC has jurisdiction over the unregulated computer operations of AT&T.

"It's not completely clear that the FCC could hold up the takeover, but we want them to spell out why they can or cannot act," said David Goldberg, legislative assistant for Rep. Tony Hall (D-Ohio). "We argue that [the FCC] has authority to look at this if only because long-distance customers might subsidize the computer operations."

Inevitable fate?

On a separate front, AT&T last week said it received requests from more than enough NCR shareholders to hold a special proxy meeting that could pave the way for AT&T's $6.12 billion takeover of NCR.

AT&T said holders of 70% of NCR's outstanding stock have pledged to sell their shares to AT&T for $90 each. The carrier also has received written letters and requests from holders of more than the 25% of NCR's outstanding shares needed to call a special stockholder meeting, which could lead to the removal of NCR's board of directors.

NCR, meanwhile, reported a 24% drop in fourth-quarter earnings to $111 million, down from $147 million in the fourth quarter a year ago. The company said its earnings were negatively affected by a $9 million charge for expenses related to fighting AT&T's hostile takeover bid.

Senior Editor Bob Brown contributed to this story.

Start-up to unveil T-3 mux

continued from page 4

cessor. That processor determines whether the traffic is circuit- or packet-switched data and routes it over the bus to the interface board supporting a link to the target destination.

This setup eliminates the need for data buffers on each interface board, resulting in faster connections between devices. The unit's central processor has a single large buffer that stores data only until the central processor is free to determine its destination.

The product can be used strictly in a local environment or to provide links between remote locations. In a local environment, the Broadband Enterprise Switch can bridge Ethernets, FDDI or token-ring nets.

The Broadband Enterprise Switch can also route traffic between nets. The initial release will support only the Transmission Control Protocol/Internet Protocol, while a second version will support Digital Equipment Corp.'s DECnet, Xerox Corp.'s Xerox Network Systems and Novell, Inc.'s Internetwork Packet Exchange protocols. The switch is designed to route traffic between networks at 50K packet/sec.

Pricing ranges from $20,000 for a CX1200 with two Ethernet interfaces supporting a total of four Ethernets to $100,000 for a fully configured CX1600 with multiple Ethernet, FDDI and T-3 interfaces.

3Com's new focus challenges

continued from page 9

the hot area," said Susan Frankle, an analyst at IDC. "If 3Com can grow along with the market, they'll do well."

3Com's edge may be its position as a one-stop shop for network products, Frankle said. Other vendors in the internetworking market have tended to focus on a more narrow product line.

But 3Com also faces some obstacles. The company has been slow to support popular protocols such as Internetwork Packet Exchange (IPX) and DECnet on its internetworking products, Erickson said.

According to 3Com's Murphy, however, the company will begin shipping NetBuilder BR/2000 and BR/3000 brouters this month that support IPX, DECnet and the Integrated Intermediate System to Intermediate System protocol, which supports dynamic routing in Open Systems Interconnection nets. 3Com has also supported advanced routing technologies such as the Open Shortest Path First protocol, she said.

Furthermore, 3Com is working to bolster its product line with support for higher speed technologies such as Fiber Distributed Data Interface, which runs at 100M bit/sec. The company also plans to build products that would tie together multiple intelligent hubs, Murphy said.

"Vendors are designing platforms with very high-speed switching capabilities for large networks of the future, and we have not announced a product that will do that," Murphy said. "We need to have a very fast packet-switching engine sometime in the near future."

There is also the question of whether 3Com's strategy to sell its internetworking products through value-added resellers will work, said Rosemary Cochran, a principal at Vertical Systems Group, a Dedham, Mass., market research firm.

"Most of the leading internetworking vendors believe that internetworking products require a direct sales force as we move toward more enterprise-wide sales," she said.

Murphy said 3Com will continue to sell directly to some customers but is now investing heavily to build partnerships with resellers since the company can't reach all customers on its own.

"In a market growing as fast as this, there is a lot of business to be had and 3Com will get it's share," said Doug Tsui, product marketing manager at cisco Systems, Inc. "But they've got a lot of catching up to do, especially in the area of software. And it's hard to compress time when it comes to developing software."

Controller links users to services

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the dynamic bandwidth allocation feature is important because it solves two problems: It reduces the circuit costs associated with tying remote LANs into a corporate backbone and it helps users cut costs by planning for average LAN traffic loads rather than peak loads.

"That is the biggest issue for large users who want to make LANs the end points of enterprise networks — the unpredictability of the traffic originating at the LAN," Gonzalez said.

But Jeremy Frank, vice-president with the consultancy Gartner Group, Inc. in Stamford, Conn., said most applications currently aren't geared toward switched connections.

"No major computer vendor can handle switched connectivity in a large production environment," Frank said. "I'm not quite as convinced as [Ascend] that people are going to migrate more than voice to a switched type of public network service."

All the Multiband models are available now. The Multiband BRI-3 costs $6,000, while the BRI-8 is priced at $8,000. Both come with the Nx56 software, which is a $4,000 option for the T/P-1 and T/P-2 models. Those products cost $5,000 and $6,000, respectively. Support for the RS-366 dialing protocol costs $500 and ISDN D-channel signaling for PRI, which costs $1,000.

Letters

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GEdney sparks memories

I enjoyed the column "Looking back at life in the far-off land of GEdney" (*NW,* Dec. 24, 1990). I am a refugee from that part of the world, GEdney 4 in Flatbush. As children, we were all bemused by GEdney. (Did they really mean "kidney"?)

I am sure you are correct about the reasons for eliminating alphabetical exchanges. I always suspected, though, that the change had something to do with New York Telephone Co. covering its tracks after all the horror stories in the mid-1960s — most, I believe, involving PLaza 2 in midtown.

The old numbers were nice and easy to remember. However, I recall doing a double take as I attempted to dial my mother at GE4 from London in 1978. The telephone dial there had only numbers.

Thanks again for running such a fun article.

Don Maguire
Independent Consultant
Flanders, N.J.

Satellites help forces in skies

continued from page 1

multinational forces first began arriving in the Saudi desert last summer.

"When we started our deployment, we had only the most rudimentary communications infrastructure in Southwest Asia and the challenge of distance was daunting," Gen. Colin Powell, chairman of the Joint Chiefs of Staff, said in a speech last month.

Satellites came to the rescue.

"Thanks to good planning and to our understanding of the importance of satellites, we quickly and smoothly transitioned to a mature tactical theater network," Powell added.

The Air Force, in fact, is relying on a cadre of satellite systems to do everything from eavesdropping on electronic communications to identifying small objects and creating radar images of targets at night or in adverse weather conditions.

Eye in the sky

Although the first attacks concentrated on destroying Scud missile sites, satellites operated by the Air Force Defense Support Program (DSP) are ready to help warn of the launch of surviving missiles.

Hovering in a geosynchronous orbit 22,300 miles above the earth, DSP satellites use an infrared telescope with 6,000 detectors to observe the hot rocket plumes of ballistic missiles and jet aircraft.

When DSP detects a launch, it transmits the information to ground-based computers in Cheyenne, Wyo. These computers integrate the satellite's real-time data with stored information about rocket plume or plane exhaust wavelength information.

DSP controllers take no more than 120 seconds to verify whether the data indicates a hostile target or some other phenomenon, such as an oil fire on the ground. When the controllers are confident of the DSP data and compare it with other information — such as radar tracking data — they relay the resulting intelligence information to commanders of all services in the Persian Gulf via high-frequency satellite or radio.

Signal gathering birds

Other satellites now in orbit are used to gather signal intelligence (SIGINT). SIGINT birds use sensitive antennas and signal processors to detect and characterize electronic emissions from Iraqi air defense radar devices, navigation aids and military communications transmitters.

In addition to eavesdropping, SIGINT satellites can help determine the location and operating patterns of radar devices and jammers, as well as the layout of enemy communications nets.

Providing this electronic order of battle can help planes avoid enemy surface-to-air missile sites and fighter patrols.

Certain spy satellites revolve around the earth in low orbits, at an altitude of 150 to 200 miles, providing images of events happening below.

Three KH-11 satellites use light-sensitive charge-coupled devices to create digital images of activities in the Persian Gulf, watching for movements of tanks and other military resources. The KH-11s reportedly can distinguish objects one foot in diameter.

The most advanced surveillance satellite is a radar-imaging spacecraft code-named Lacrosse. Although in geosynchronous orbit, Lacrosse can resolve objects between three and ten feet across. Lacrosse provides the Air Force and Central Intelligence Agency with images that are not affected by nighttime or weather conditions.

U.S. bombers take flight.

The imagery from reconnaissance satellites is transmitted to Washington, D.C. via the Satellite Data System or other relay satellites, including commercial communications satellites. The Air Force's Airborne Warning and Control System (AWACS) planes can also download satellite data and transmit radar images of a Middle East air war back to the U.S. by satellite.

The primary ground station for receipt of the satellite imagery is at Ft. Belvoir, Va., an Army facility just south of Washington, D.C. Digital tape containing the images is then processed at White Sands, N.M., Ft. Belvoir and the CIA's National Photo Interpretation Center. The images are then analyzed and retransmitted to military commanders in the Persian Gulf via mobile receiving stations deployed throughout the Gulf region.

"The signals are received at Ft. Belvoir, but they can be transmitted instantly to the field so that, for example, a tank commander in Kuwait can see what is aligned against him," says William Burrows, author of *Deep Black: Space Espionage and National Security.*

The National Reconnaissance Office has staff members stationed at the Air Force Space Command and at the White House to coordinate overall satellite reconnaissance operations and inform President Bush of the resulting intelligence.

State your position

At the front line, a satellite system called the Navstar/Global Positioning System (GPS) helps Air Force planes outfitted with GPS receivers achieve pinpoint bombing and nighttime air strikes. The system is believed to have been used in the U.S.'s opening air strikes against Iraq.

The Navstar/GPS system, developed by the Air Force in the early 1970s, allows troops to instantly determine their geographic location to within 52 feet, velocity to within four inches per second and the time to within one millionth of a second.

Navstar/GPS operates on the principle of triangulation, with receivers picking up signals from four satellites, each of which communicates its position in the sky. Each receiver then performs a series of complex calculations to pinpoint its precise longitude, latitude and altitude.

To prevent guerrillas or terrorists from using the Navstar/GPS system to target bombs or missiles, the Air Force relies on a feature called Selective Availability (SA) to deliberately degrade navigational accuracy to about 300 feet, compared with accuracy of 50 feet. Only military users can access the code necessary to correct for SA error.

Avoiding sand storms

Finally, the Air Force controls two Defense Meteorological Satellite Program satellites, each of which flies over the Persian Gulf twice every 24 hours.

The satellites use sensors to collect detailed weather information and store their data in onboard tape recorders for transmission to ground stations in Kaena Point, Hawaii, and at Fairchild Air Force Base in Washington state.

The data is then relayed via commercial communications satellites to the Air Weather Service's Air Force Global Weather Center at Offutt Air Force Base in Omaha, Neb., and the Navy's Fleet Numerical Oceanography Center at Monterey, Calif. From these locations, the data is transmitted by satellite to U.S. military facilities, ships and ground commanders around the world.

Herbst is a free-lance writer based in the Washington, D.C. area.

Articles next week in *Network World* will detail the communications networks backing up the U.S. Army, Navy and Marines.

Tactical tools put to test

A portable terminal called Constant Source One is one of the more innovative telecommunications technologies that may get a shakedown in the Desert Storm operation.

Constant Source provides tactical commanders with direct access to the wealth of information that streams in from satellites and other surveillance platforms.

Constant Source is a product of a spy satellite program called Tactical Exploitation of National Capabilities (TENCAP). (In intelligence jargon, the phrase "national capabilities" means spy satellites.)

TENCAP seeks to remedy the fact that technical limitations and the tight security restrictions placed on raw intelligence data have discouraged tactical users from exploiting space intelligence, thus limiting its use to a small number of national leaders and nuclear force commanders.

TENCAP has developed secure methods and portable terminals to allow speedy access to satellite intelligence over tactical communications channels.

More than a dozen Constant Source portable ground receiver units are deployed in the Desert Storm operation. They allow Air Force wings and squadrons to download data from various signal intelligence (SIGINT) sources and KH-11 and Lacrosse satellites within 10 minutes of collection.

The data can be correlated and displayed, and a tactical intelligence report produced within six minutes.

The report can be uplinked directly to field commanders using a UHF communications satellite.

Observers say field units are learning how to use the terminals, making hourly updates on the disposition of Iraqi troops based on data from satellites and ground stations a common procedure.

— *Kris Herbst*

Netrix to detail support

continued from page 4

frame relay will make the #1-ISS a flexible switch for data applications. Users will be able to choose among circuit-switched, X.25 packet-switched or frame relay transport modes, depending on their application needs.

Support for frame relay through a free software-only upgrade is important because it gives users the ability to switch among the three transport modes via the net management console, Malone said.

For users with heavy frame relay traffic, Netrix will offer a new $18,500 Switching Connector Module, which is a board dedicated to frame relay processing, Jones said. Other #1-ISS processor modules handle all types of traffic.

To ensure that applications such as large file transfers do not squeeze out other applications, users can employ the guaranteed throughput feature to give any application a user-definable level of throughput.

Netrix will allow X.25 data to ride between #1-ISS nodes on top of frame relay packets. That promises to increase throughput because X.25 data will be subject to error checking only at end points rather than at every node.

Jack Haverty, internet architect in the network products division at Oracle Corp. in Belmont, Calif., said his company plans to test Netrix's frame relay implementation. Oracle uses Netrix switches to interconnect local-area networks worldwide but has had problems with X.25 interfaces on routers and packet switches, which are typically limited to 56K bit/sec.

"Although there's lots of extra bandwidth inside the backbone itself, there's a bottleneck at the end because of the X.25 interface," Haverty said.

FEDEX International Transmission Corp., a packet net provider in Memphis, Tenn., uses Netrix switches to offer high-speed packet-switched services, said Gary Ragsdale, assistant vice-president of the company.

"We offer packet-switching services at 56K and are increasing that to 256K, but customers are asking for speeds even higher than that," especially customers interconnecting LANs, Ragsdale said. "We anticipate frame relay will offer higher performance for LAN requirements."

Netrix's new SelectView, which lets users logically partition their networks for management purposes, is targeted at users like Ragsdale, Jones said.

With the feature, public net providers can partition a network so that each customer is able to view and control its own piece. Users can, for example, employ the feature to divide their nets by regions, divisions or areas of responsibility.

SelectView runs with existing #1-ISS net management software on a Hewlett-Packard Co. Apollo Division workstation. Initial shipments of SelectView are expected to begin in April. The software is priced at $25,000.

Senior Editor Bob Brown contributed to this story.

Desert Storm pressures nets

continued from page 1

calls [were] being blocked [the next day] because of volume. Domestically, the network functioned normally."

The carrier lost all direct circuits to Iraq at 7:03 p.m. Eastern Standard Time Wednesday.

Officially, AT&T said it halted work on its net, including upgrades and changes to customer nets, on the day after the attack.

On Thursday, an AT&T spokesman said, "AT&T took temporary safeguards, including deferral of new work, to ensure the security of its net. We are satisfied we met those requirements, and service to our business customers will be provided as needed."

One AT&T account representative said his office alerted customers the day after the U.S. attack that AT&T was on what he termed Condition Blue.

> Despite the hectic trading, the financial markets had no difficulty handling the surge in volume. After the 1987 stock market crash, most exchanges had increased their systems' processing capacity.

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"AT&T put into effect restrictions on certain types of work," the representative said.

"[We told] customers that we suspended nonessential work until further notice. Among the functions involved [were] circuit order processing, central office installation, outside plant activities and routine testing," he added. "The intent of the restrictions [was] to allow AT&T to concentrate its efforts on providing and maintaining service critical to the national interest."

High volumes

A spokeswoman for US Sprint Communications Co. said call volumes rose significantly between the U.S. and the Middle East on the night of the attack and the following day, but she said, "there was really no impact on the domestic network."

MCI Communications Corp. declined to comment on calling volumes.

Bell Communications Research's National Security Emergency Preparedness (NSEP) organization serves as a single point of contact for the government to address the regional Bell holding companies about security issues.

"NSEP coordinates the provisioning of communications services to the federal government in matters involving national security and major emergencies," a Bellcore spokesman said. "If the government requests Bellcore assistance in operation Desert Storm, we will respond, but we will not comment on our involvement."

Although the Federal Communications Commission has no formal mechanism for alerting carriers to potential terrorist activities, Ken Robinson, senior advisor to FCC Chairman Alfred Sikes, said FCC personnel were in regular contact with carriers regarding security.

Another FCC official, who asked not to be named, confirmed that the FCC is working with Department of Defense agencies to determine procedures for network restoration, installation and maintenance.

The FCC is one of 23 agencies that comprise the National Communications System (NCS). The NCS was established in 1963 to coordinate planning and provisioning of telecommunications services to the government in times of crisis or national emergencies.

Financial nets heat up

The successful first day of war in the Persian Gulf sparked heavy trading in financial markets in the U.S. and abroad. The Dow Jones industrial average posted its second highest gain ever, closing up 114 points. It finished the day at 2623.51 on heavy trading of 330 million shares.

Despite the hectic trading, the financial markets had no difficulty handling the surge in volume. After the 1987 stock market crash, most exchanges increased their systems' processing capacity. Nevertheless, the exchanges took extra precautions to ensure that trading wouldn't overload their systems.

John Diesem, senior vice-president of systems technology at the American Stock Exchange, said the exchange made sure key people were available to handle any problems and stepped up monitoring of the trading floor.

Despite the heavy trading, Diesem said the exchange's systems were never utilized at more than 50% of their total capacity.

Chuck Garrison, vice-president of telecommunications at the Chicago Board Options Exchange, said that on the day after the invasion, the exchange experienced its highest volume of trading since the stock market crash of 1987. But, "for all practical purposes we sailed through the day," he said.

Garrison said the exchange had been working feverishly in the past two weeks readying contingency plans in case heavy volumes forced the U.S. exchanges to halt trading.

Garrison prepared for a conference call between officials of major U.S. exchanges to synchronize the closing and reopening of markets in case the outbreak of war precipitated panic trading.

He also established additional alternate routing in case the local exchange or interexchange carriers experienced an outage or degradation in service due to heavy calling volumes or other reasons.

Users were ready

Financial service firms reported that the outbreak of war had little impact on their operations.

Since the crash of 1987, most firms have increased the capacity of their systems to handle spikes in trading volume and established disaster recovery programs to protect against outages or catastrophes.

"We have made extensive contingency plans in case of network outages," said Joe Vinci, a network manager at J.P. Morgan, Inc. in New York. "We are now taking even more precautions in light of the war."

The onset of war increased user concern over security.

Network executives met with internal security officials and with carriers in some cases to bolster disaster recovery plans. Others are more closely monitoring network traffic to pinpoint unauthorized network usage.

"We're concerned [about terrorist attacks]," said Keith Jonas, corporate communications executive with C&S/Sovran Financial Corp., a bank holding company. "We've beefed up the physical security in our operations centers and our branches."

Jonas has reason to be concerned because the bank has branches in the Pentagon and several military bases in the region that could become targets. The bank is preparing its staff to implement an upgraded disaster recovery plan devised to restore operations following a bombing or other terrorist attack.

Other users have taken measures to protect against virsuses, a nonviolent attack that has devastating implications for networks.

Some have changed passwords on their systems while others have taken to monitoring traffic on the nationwide Internet, which provides links between many of the country's defense contractors, research labs and educational institutions.

"I'm asking my people who manage our Internet gateway to spend more time watching the traffic," said Tom Nakamura, product manager for engineering design network at Hughes Aircraft Co. ☑

Firms add micro to image world

continued from page 1

FileNet, the Add+Image personal computer interface for the new DECImage Express image processing system from DEC and the new version of Wang's OPEN/image for Novell, Inc.'s NetWare 386 — were introduced at the Image Management Technology conference hosted here last week by IDC/Avante, a joint venture of International Data Corp. and Avante Technology, Inc.

Each of the vendors has taken a different approach to personal computer support.

For example, FileNet's Workflo personal computer software, available now, enables microcomputers running Microsoft Corp.'s Microsoft Windows 3.0 to perform the image compression, decompression and formatting needed to send and retrieve images from a FileNet Optical Storage and Retrieval (OSAR) system running the company's Workflo image management software.

The FileNet OSAR consists of an optical jukebox and multiple proprietary FileNet servers — linked via Ethernet — that process and store images. The Workflo image management software indexes, formats and manages the distribution of images among OSAR devices.

The Workflo Business System consists of three software modules: WorkForce Desktop, which costs from $1,250 to $2,145 per module and must be loaded on each remote personal computer linked to a FileNet server, and the $7,995 WorkFlo and $995 Powerform system development kits that let users custom-design imaging applications.

John Cavallito, assistant department head for clinical data processing at Burroughs Wellcome Co., a pharmaceutical company in Research Triangle Park, N.C., said he plans to use FileNet's Workflo Business System to enable some 500 personal computer users to access document images in a FileNet OSAR.

DEC's product

DEC takes an approach similar to FileNet's with the Add+Image and CorVette interfaces to its new DECImage Express product — the first full-blown image processing system from the vendor.

Until now, DEC has sold only components of image processing systems that users or systems integrators had to piece together with equipment from other vendors.

The DECImage Express consists of software that runs on a VAX minicomputer. The system processes and indexes images that can be accessed via remote VAX workstations or DEC's DECimage 1200 X Window System.

In order to link personal computers to a DECImage Express host, users must buy either the CorVette or Add+Image products from LaserData, Inc., a maker of image processing systems in Tyngsboro, Mass.

Add+Image consists of software that enables any personal computer running Microsoft Windows 3.0 to view images stored on a DECImage Express host via a DECnet connection. It is available now and costs $225.

CorVette does the same thing, except that it adds a high-resolution monitor and an image processing board that speeds up image compression and decompression. CorVette costs $4,500.

Wang's approach

The new version of Wang's OPEN/image is a Netware Loadable Module that lets users access images stored in optical storage devices attached to a NetWare server. Previously, Wang only sold products that supported limited personal computer networking capabilities or that worked only in a proprietary Wang environment ("Wang intros OPEN/image for NetWare, *NW*, Jan. 14).

Ira Morrow, vice-president for technology planning at Shearson Lehman Brothers, Inc. in New York, said he plans to use the new Wang product to give several hundred employees access to document imaging capabilities over the next few years. ☑

NETWORK WORLD

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Utility picks Net/Command

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capabilities of a single console.

PSE&G has Net/Command running on a Sun Microsystems, Inc. SPARCserver 470 server attached via Ethernet to four Sun SPARCstation 1+ diskless workstations configured as administration consoles.

PSE&G selected the system after a five-month request for proposal and evaluation process that pitted Net/Command against AT&T's Accumaster Integrator, IBM's NetView and Nynex Corp.'s Allink. Digital Equipment Corp. did not respond to the RFP.

The utility was searching for a system to help it streamline management of its T-1 network, which includes more than 25 NET IDNX T-1 nodes and Racal-Milgo modems supporting 9.6K bit/sec analog circuits. NET's Series 5000 Network Management System manages the IDNXs, while Racal-Milgo's Communications Management Series 2000 controls the modems.

The telecommunications infrastructure supports a Systems Network Architecture network managed by NetView. PSE&G required that all three management systems be supported under its new integrated system. Net/Command fit the bill, Lewis said.

"It only requires each of the element management systems to have a straight ASCII printer port" through which the systems send error messages for printing, he said. "We hook a cable to that printer port and then transfer the ASCII stream into Net/Command." Net/Command filters the alerts using predefined criteria and sends the appropriate alerts to the management console.

What helped separate Net/Command from the competition, Lewis said, was its Alert Logic Filter Editor (ALFE).

ALFE is a menu-driven program that lets users define what should be done with the ASCII alarm data as it arrives. It helps filter messages by allowing users to discard some messages while directing others to a console or to a data base of historical information.

For example, an IDNX node may signal that it has an error condition, in which case attached modems will likely generate alarms as well. Using ALFE, Net/Command can be programmed to discard the modem alarms.

The learning curve in training operators to use ALFE is relatively short, Lewis said, and no programming background is required. That separated it from the other management systems that required more advanced programming skills.

Another problem with management systems such as AT&T's Accumaster Integrator is that they require attached management systems to conform to a particular interface specification, he said. That limits the array of element management systems from which users can choose.

"I'm a very avid supporter of standards," Lewis said. "But if I have an option of not being put behind the eight ball, I will exercise that option. Net/Command allowed me to do that."

Standards will become more important as they support features that allow control over attached management systems, he said. For example, AT&T intends to give the Integrator control over attached management systems by adhering to Open Systems Interconnection net management standards. Today, however, it uses terminal emulation and windowing to control attached systems.

That's also how Net/Command offers control of the systems it supports, Lewis said. He said Boole & Babbage Network Systems is committed to standards and will support the OSI standards as they become better defined and more functional.

Automation lacking

Lewis acknowledged that NetView and Nynex's Allink were ahead of Net/Command in automated net management, or responding to alarms without operator intervention. He said he was close to an agreement on an expert system that would add those features to Net/Command but declined to say who would supply it.

Lewis is also working to install the next release of Net/Command, Version 2.1, which will add graphic network maps, charts and graphs to the user interface (see "Version 2.1 capabilities," this page).

But the system is already saving PSE&G money by letting it trim staff. "We have drastically cut down on the number of people who run the network," he said. "We're operating in a much more lean mode, and the technology of Net/Command lets us continue to meet our service-level agreements with our clients."

With Net/Command, PSE&G has reduced the number of net management consoles it uses from 19 to about 10, but the goal is to use only four, Lewis said.

Version 2.1 capabilities

SUNNYVALE, Calif. — Boole & Babbage Network Systems next month is expected to announce Net/Command Version 2.1, which will add a graphic mapping feature to the integrated net management system to support views of physical or logical network elements.

Boole & Babbage Network Systems will also announce an interface that will enable Net/Command to send alarm data to AT&T's Accumaster Integrator net management system. In effect, that will give the Integrator support for management systems that are supported by Net/Command but not by the Integrator.

Net/Command is a management tool designed to consolidate the array of net management consoles in a user data center by collecting data from virtually any element management system's ASCII printer.

The new capabilities will be announced at next week's Communication Networks '91 conference in Washington, D.C., where the interface will be demonstrated.

Previous versions of Net/Command supported only a text-based interface, said Gail Foster, product manager for network products at Boole & Babbage Network Systems, the former Avant-Garde Computing, Inc.

Version 2.1 will support a real-time network mapping function that users can tailor to suit their needs, Foster said. For example, the map can show physical or logical network elements such as applications.

As alarms come in, icons representing different net components change color in accordance with an International Standards Organization-defined color-coding scheme.

The interface to AT&T's Integrator will be a one-way link that conforms to AT&T's specification for sending alarm data, Foster said. To control management systems supported by Net/Command, users would employ the terminal-emulation and windowing features of Net/Command.

Foster said her company is working on a two-way interface but that will require support for the Open Systems Interconnection Common Management Information Protocol (CMIP). She declined to estimate when CMIP support would be available for Net/Command.

Boole & Babbage Network Systems will also announce a new feature with Version 2.1 that lets users trip alarms based on predefined thresholds.

Net/Command Version 2.1 is scheduled to be available next month. An entry-level, software-only system with support for two attached management systems costs $60,000. The new release will run on Sun Microsystems, Inc.'s SPARCstation 2 workstations, whereas the previous version ran on the SPARCstation 1.

— *Paul Desmond*

Travelers to use wireless LANs

continued from page 2

technology was BICC Data Network's support of the IEEE 802.5 specification on its InfraLAN offering. The Travelers was a beta test site for the product.

Lack of compliance with Ethernet and token-ring standards has fostered some resistance to wireless LAN technology, according to Robin Rather, an analyst with the Washington, D.C.-based market research firm Information Strategies, Inc. "Wireless LANs are going to have to act like and offer the same features as regular LANs," she said.

One of the major selling points of wireless LANs is that they remove the need for cabling and facilitate adding or moving nodes on the network. Both activities can be costly with traditional structured wiring systems.

At The Travelers, the majority of wireless LANs will be installed in the company's 260 field offices around the country. Almost all of those offices are leased facilities that are frequently relocated, Blazensky said. Almost 30% of The Travelers' employees move within a year, and most of those people are in field offices.

Of the 140 new token-ring LANs that The Travelers established in 1990, 100 could have been wireless if the technology had been available to the company at the time, Blazensky said.

In favor of wires

Some analysts who regard wireless LAN technology as peripheral to the overall LAN market argue that with the advent of the 10BaseT standard, unshielded twisted-pair wire has become the cost-effective medium of choice for LANs. Buildings must be wired for telephone services anyway, they claim.

Other analysts say that even with twisted pair in place, rewiring and maintenance costs are forcing users to find alternatives.

According to Blazensky, even though the purchase prices of wireless and cable LANs are comparable, rewiring costs result in a higher monthly cost per workstation for cabled LANs. For a typical cabled LAN at The Travelers, the monthly cost is $20, while the cost is less than $10 per workstation for a wireless LAN.

Analysts forecast that the size of the wireless LAN market in 1995 will range from 1% to 10% of the overall LAN market. International Data Corp., a Framingham, Mass., market research firm, projects that the value of the wireless LAN market will be as high as $500 million by 1995.

The InfraLAN product includes a base unit that serves as a media access unit and repeater, connecting as many as six workstations to the token ring. For each base unit, there are one to two infrared transceivers, called optical nodes. When two optical nodes are employed, the ring has a loop-back capability that provides a measure of fault tolerance when one of the paths between the optical nodes is obstructed.

The InfraLAN 4M and 16M bit/sec token-ring versions are available now. An Ethernet version will be available in the second quarter. A base unit with two optical nodes costs $2,995.

Partnerships focus of meet

continued from page 4

tegic vendor partnership is a service-level contract that delineates expected product performance and support levels. The vendor commits to lower pricing or higher discounts and can set forth minimum annual revenue expected from the customer.

"A user should not lose sight of the need for some type of document that he can pass to his legal department if the partnership collapses," said William Hegge, telecommunications director for Northwest Mutual Life Insurance Co. in Milwaukee.

McGladrey & Pullen's Manning said, "The contract is a statement of expectations spelled out by both the user and the strategic vendor partner."

Mark Smith, assistant general counsel with Northwestern Mutual, said, "Negotiating the contract makes all the difference in the world. It should include a definition of the term 'strategic vendor partner' as it applies to [your particular] relationship and set standards for support and performance."

Although some users see the benefits of moving to strategic vendor partnerships, they said they would first have to sell the change to top management.

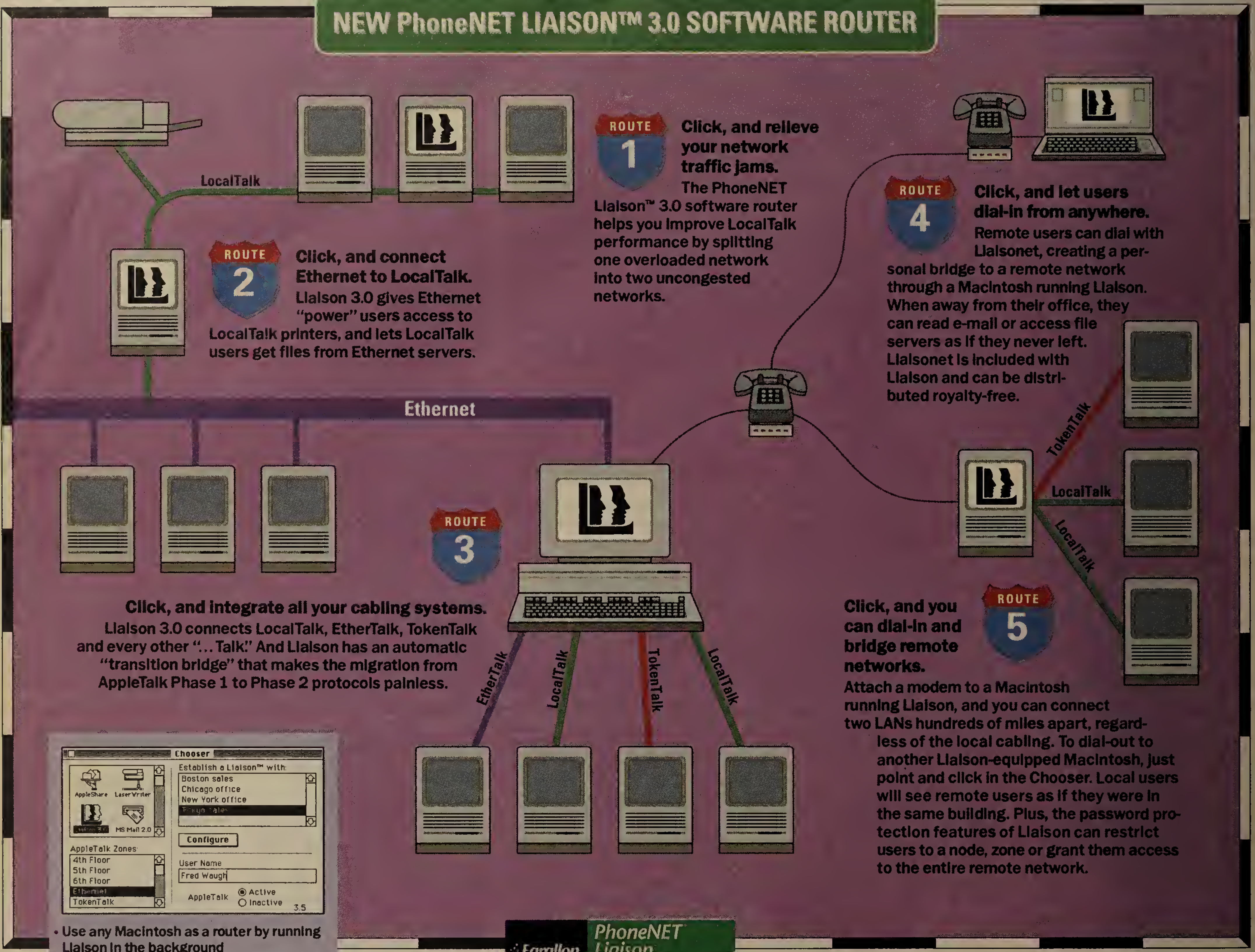
"This approach would need to gain credibility with and support from senior management," said Lance Ede, a telecommunications manager with Electronic Data Systems Corp. in Plano, Texas. "There's no doubt [that] partnerships are more useful, but we want to make sure that we don't lock out smaller firms that can quickly bring innovative products to market."

Other speakers cautioned attendees that partnerships require a great investment of time and have to be periodically reviewed to determine if the vendor has lived up to its responsibilities.

"A strategic vendor partnership is not a free lunch for either party," said John Henderson, author and professor of MIS at Boston University's School of Management. "The customer and the vendor have to step up to the cost of a partnership."

Five reasons to take an alternate router.

NEW PhoneNET LIAISON™ 3.0 SOFTWARE ROUTER



ROUTE 1 Click, and relieve your network traffic jams. The PhoneNET Liaison™ 3.0 software router helps you improve LocalTalk performance by splitting one overloaded network into two uncongested networks.

ROUTE 2 Click, and connect Ethernet to LocalTalk. Liaison 3.0 gives Ethernet "power" users access to LocalTalk printers, and lets LocalTalk users get files from Ethernet servers.

ROUTE 3 Click, and integrate all your cabling systems. Liaison 3.0 connects LocalTalk, EtherTalk, TokenTalk and every other "...Talk." And Liaison has an automatic "transition bridge" that makes the migration from AppleTalk Phase 1 to Phase 2 protocols painless.

ROUTE 4 Click, and let users dial-in from anywhere. Remote users can dial with Liaisonet, creating a personal bridge to a remote network through a Macintosh running Liaison. When away from their office, they can read e-mail or access file servers as if they never left. Liaisonet is included with Liaison and can be distributed royalty-free.

ROUTE 5 Click, and you can dial-in and bridge remote networks. Attach a modem to a Macintosh running Liaison, and you can connect two LANs hundreds of miles apart, regardless of the local cabling. To dial-out to another Liaison-equipped Macintosh, just point and click in the Chooser. Local users will see remote users as if they were in the same building. Plus, the password protection features of Liaison can restrict users to a node, zone or grant them access to the entire remote network.

Chooser

Establish a Liaison™ with:
Boston sales
Chicago office
New York office

AppleTalk Zones:
4th Floor
5th Floor
6th Floor
Ethernet
TokenTalk

User Name
Fred Waugh

AppleTalk ● Active ○ Inactive

- Use any Macintosh as a router by running Liaison in the background
- Password protection, "hide" options and dial-back features
- Connects LocalTalk, EtherTalk and TokenTalk
- Supports AppleTalk Phase 1 and 2
- User-customizable script to support a wide range of modems and communication devices
- "Private use" feature lets Liaisonet users connect to a remote network without disconnecting from their own LAN

Liaison 3.0 is a valuable alternative to a hardware router because it's more flexible and easier to upgrade. Plus, you can configure Liaison 3.0 to run on any Macintosh. So take an alternate router by calling Customer Service at (415) 596-9000. Ask for a Liaison data sheet. Dealers call our Reseller Hotline at 1 (800) 344-7489 in U.S. and Canada.

Farallon®

The Personal Communications Company™

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